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Husband-wife communication and contraceptive behaviour in Sri Lanka

Dr. W. Indralal De Silva

Introduction

Although husband-wife communication has been identified as an important factor in the process of decision making about family size and the adoption of family planning practices[1,2], few fertility surveys have included the responses of both husbands and wives. Usually, responses are collected only from the wife, partly on the assumption that husbands and wives have the same view and, moreover, that the husband's values can be ascertained by asking the wife to respond in the way she thinks her husband would. Coombs and Chang[3], however, provide evidence that neither the husband nor the wife should be accepted as a surrogate respondent. The extent to which husbands and wives agree in their attitudes towards a number of key issues that may affect fertility behaviour shows that although the aggregate views of men and women are remarkably similar, those of married couples are frequently in disagreement.

Spouses who communicate on matters related to sex have favourable attitudes to family planning. Therefore, they exhibit a somewhat lower fertility than those who either do not communicate with each other about their sex life, or seldom get an opportunity to do so[4-6]. Since Sri Lankan fertility is in transition and targeted to reach replacement level by the year 2001, there has been an increasing recognition of the importance of communication between spouses in successful family planning. Even though there are very few Sri Lankan studies on husband-wife communication with regard to contraceptive behaviour[7], there is sufficient evidence from studies conducted in other countries to substantiate the dominance relations and segregation roles which may affect the possibility of the husband and wife jointly deciding to practice family planning. Therefore, this study examines the level of husband-wife communication on family planning, and the factors associated with communication such as initiation of discussion of family planning, time reference of the first discussion, and decision making in Sri Lanka. Agreement between the husband and wife reporting on their contraceptive use is also examined.

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Data and its quality

The national survey of 1982, the Sri Lanka Contraceptive Prevalence Survey (SLCPS), conducted by the Department of Census and Statistics, covered all the 24 districts in Sri Lanka and enumerated 4,500 ever-married women between the age of 15-49 years. In 1985, the Sri Lanka Contraceptive Survey (SLCS), a follow-up of the 1982 respondents, was conducted by the same department. However, owing to civil disorder, seven districts in the northern and eastern parts of the country were excluded from the follow-up survey. The seven districts constituted only 14 per cent of the total population of Sri Lanka. Altogether, the sample of the 1985 follow-up study covered 2,310 respondents along with a randomly selected sample of 577 (about one-quarter) of the interviewed women's husbands.

As defined by the Department of Census and Statistics, the sample of the 1985 follow-up survey comprised all the 1982 SLCPS respondents who lived in the sample districts, were married at the time of both the 1982 SLCPS and 1985 SLCS, and were below 50 years of age at the time of the latter survey. The 1985 follow-up study therefore necessarily covers only women who had been married for at least three years and were 18 or more years of age. In the 1985 survey, all attempts were made to interview husbands and wives separately, and the questionnaires were also administered separately to men by a male investigator, and to women by a female investigator. Husband and wife questionnaires obtained virtually identical information from all 2,310 currently married women and 577 of their husbands on such subjects as fertility preferences, communication, decision making and use of contraception. The present study of husband-wife communication used the information derived from these 577 conjugal pairs only.

The 1985 full sample of women (2,310) and its sub-sample of 577 women whose husbands' information was collected, were both remarkably similar in their age and background variables (Table 1). However, it should be noted that the seven districts which were excluded from the 1985 follow-up contain a higher proportion of Sri Lankan Tamils than the national average: according to the last census of 1981, the total population of Sri Lanka comprised 74 per cent Sinhalese, 13 per cent Sri Lankan Tamils, 5 per cent Indian Tamils, and 7 per cent Moors.

TABLE 1

Percentage distribution of the 1985 SLCS samples by selected variables

Variable	1985 SLCS, all wives	1985 SLCS, wives from the husbands' sub-sample
Age (years)		
< 20	0.3	0.9
20-29	23.9	29.0
30-39	45.1	41.5
40-49	30.7	28.6
Education		
No schooling	12.6	15.8
1-5 years	34.8	31.4
6-9 years	34.2	33.8
10+ years	18.4	19.0
Ethnicity		
Sinhalese	87.3	83.0
Sri Lankan Tamil	1.1	1.0
Indian Tamil	7.8	11.1
Moor	3.6	4.7
Other	0.2	0.2
Contraceptive use		
Current user	69.0	70.7
Current non-user	31.0	29.3
Total (N)	2310	577

Source: 1985 SLCS data tape on full sample and 1985 SLCS data tape on sub-sample of matched wives and husbands.

The ethnic variable in Table 1 shows a high inclusion of Indian Tamils in the husbands' sub-sample, perhaps because the husbands living in the estate sector were slightly more accessible for interviews than those living in other areas during the 1985 survey. Females in the estate sector had a higher labour force participation rate as compared to males in that sector, or to females in the rest of the country.

Contraceptive use among wives in both the 1985 SLCS full sample and in the husbands' sub-sample showed a remarkable similarity (Table 1). However, an explanation is required for the contraceptive prevalence rate of 70 per cent which is even higher than the observed prevalence rate of 62 per cent in the 1987 Sri Lanka Demographic and Health Survey. The 1985 survey included only currently married women aged 18-49 years living in the 17 districts covered in the survey. Since these women were married for three or more years at the time of the 1985 SLCS, it is natural to expect a higher prevalence of contraception among them than among women who had been married for less than three years. Moreover, the seven districts excluded from the 1985 SLCS consist of a majority of Sri Lankan Tamils and Moors, whose contraceptive use rates are lower than those of the Sinhalese and the Indian Tamils;[8,9] thus the present sample with a small proportion of Sri Lankan Tamils and Moors has produced an upward estimate of contraceptive use.

Results and Discussion

It is important to examine the role of husbands and wives in contraceptive decision making to achieve a high level of contraceptive behaviour.[10-12] From a programme management point of view it is very useful to identify couples who have limited communication or do not agree on matters of family planning and who are less likely to practice contraception effectively.

Interspousal communication on family planning for the first time

An examination of preferences regarding family planning at the intra-familial level is important because it is linked to husband-wife discussion, and may influence actual fertility by reducing the psychic costs of fertility regulation. Table 2 presents the level of agreement between the spouses on when they first thought of practising family planning.

As Table 2 indicates, about 92 per cent of the wives stated that they had thought of using a family planing method some time in their lives as compared to 84 per cent of their husbands who reported the same (Table 2). Thus, twice as high a proportion of husbands (16 per cent) as of wives (8 per cent) had never thought of using family planning. A high proportion of husbands (30 per cent) and wives (34 per cent) first thought of using family planning only after they had had three or more children as against a small proportion (about 2 per cent) who had thought so even before their marriage, and before their first offspring. As Table 2 clearly shows, in Sri Lanka, couples tend to practice family planning in the early stages of family formation; nearly one-third of husbands and wives in this study had first thought of practising family planning soon after the birth of their first child.

When we look at the percentage of husbands reporting the same time reference as their wives on when they first thought of using contraception, a high proportion of the responses of the husbands are found to be consistent with their wives' (Table 2). For instance, of the 179 wives who said that they first thought

TABLE 2
Level of agreement between husband and wife on when they first thought of using family planning

Time reference	% who first thought of using FP among		% husbands reporting same time as wives
	Husbands	Wives	
Ever thought of FP			
Before marriage	2.1	2.0	8.3 (12)
Before 1st child	5.5	4.2	12.5 (24)
After 1st child	26.7	31.0	43.6 (179)
After 2nd child	18.6	18.8	36.1 (108)
After 3 children	29.6	34.2	52.8 (197)
Don't remember	1.6	1.7	0.0 (10)
Ever thought	84.1	91.9	42.5 530)
Never thought	15.9	8.1	61.7 47)
Total	100.0 (577)	100 0 (577)	

Source: 1985 SLCS data tape on sub-sample of matched wives and husbands.
Figures in brackets denote the number of respondents.

about family planning after the birth of their first child, about 44 per cent of the husbands said the same. On the other hand, among the 47 wives who said that they never thought of practising family planning, 62 per cent of their husbands gave the same response.

Where communication is present, the evidence supports the conclusion that it is positively related to contraceptive use and negatively related to the demand for children.[13-15] Discussion of family planning helps to improve the couple's knowledge of family planing, creates a favourable attitude towards the programme, and ultimately helps them to adopt contraception.

The individual responses of the husbands and wives indicates that in Sri Lanka, discussion of family planning takes place very frequently; about 78 per cent of the wives and 74 per cent of the husbands had ever discussed family planning (Table 3). As indicated by many researchers, the wives initiate the discussion on family planning more often than the husbands because they are more affected by the consequences of unplanned pregnancies, and have more access to family planning information.[13] As there is a higher level of female literacy and female status in Sri Lanka than in other South Asian countries, it is natural to expect a higher level of interspousal discussion on family planning. For instance, the corresponding percentage of spouses who discussed family planning in India as observed in a national survey in 1980, was only 35 per cent.[16]

When conjugal communication on the first discussion on family planning was examined in relation to its time reference, 7 per cent of the husbands and wives were observed to have discussed it even before the birth of the first child. Since a majority of the couples intended to have small families,[17] and also wished to postpone the second birth, 25 per cent of the husbands and wives in the sample had first discussed family planning for the

TABLE 3
Level of agreement between husband and wife on when they first discussed family planning

Time reference	% who first thought of using FP among		% husbands reporting same time as wives
	Husband	Wives	
Ever discussed			
Before marriage	1.6	2.3	15.4 (13)
Before 1st child	5.9	4.2	20.8 (24)
After 1st child	24.8	26.0	44.7 (150)
After 2nd child	17.0	16.8	37.1 (97)
After 3 or more children	24.6	27.4	45.6 (158)
Don't remember	0.1	1.0	0.0 (6)
Ever discussed	74.0	77.7	40.6 (448)
Never discussed	26.0	22.3	51.9 (129)
Total	100.0 (577)	100.0 (577)	

Source: Same as Table 2.
Figures in brackets denote the number of respondents.

first time after the arrival of their first born (Table 3). By the time they had had at the most two children, almost one-half of the husbands and wives had discussed family planning with their spouses. Of those who reported such discussions, only a small proportion was unable to remember exactly when they had done so.

When the level of agreement between the husbands' and wives' responses on when they first discussed family planning was examined, 41 per cent of the husbands were found to have given the same time reference as their wives. About 45 per cent of the husbands' responses were consistent with those of their wives among the 150 wives who reported that they had first discussed family planning with their spouses after the birth of the first child. It may be argued that couples who discuss family planning in the early stages of family formation should be more effective in achieving their fertility desires because their decision making is more explicit.

Higher levels of family planning discussion have been associated with greater fertility regulation in many studies.[18-21] Therefore, it was considered worthwhile to identify the demographic and socioeconomic characteristics of the wives who reported identical time references with their husbands on when they had first discussed family planning, and of those couples who had never discussed family planning with each other. This is important because family planning programmes can be directed towards couples who have lower levels of discussion or couples who have had no discussion on family planning.

When husbands and wives were considered separately, over 75 per cent said that they had ever discussed family planning with their spouses, but only 32 per cent of husbands and wives reported identical times when they had had such discussions (Tables 3 and 4). Another 46 per cent of the husbands and wives had dis-

TABLE 4
Level of agreement (percentage) between husband and wife on when they first discussed family planning by selected variables related to the wife

Variable (wife)	Husband and wife report same time of first FP discussion	Husband and wife report different time of first FP discussion	Husband and wife have never discussed FP	Total (N)
Age (years)				
18-29	35.9	42.2	21.9	100.0 (128)
30-39	33.1	47.2	19.7	100.0 (269)
40+	26.1	47.2	26.9	100.0 (180)
No. of living children				
0-2	27.3	42.1	25.7	100.0 (202)
3-4	30.3	52.3	19.2	100.0 (239)
5+	42.6	41.2	22.8	100.0 (136)
Age at marriage (years)				
< 20	27.3	45.0	27.7	100.0 (231)
20-24	30.3	51.9	17.8	100.0 (231)
25+	42.6	36.5	20.9	100.0 (115)
Education				
No schooling	23.1	48.3	28.6	100.0 (91)
1-5 years	27.1	35.9	37.0	100.0 (181)
6-9 years	37.5	49.2	13.3	100.0 (195)
10+ years	35.5	55.5	9.0	100.0 (110)
Residence				
Urban	40.4	46.8	12.8	100.0 (94)
Rural	31.1	48.0	20.9	100.0 (408)
Estate	22.7	34.7	42.6	100.0 (75)
Religion				
Buddhist	34.1	46.8	19.1	100.0 (451)
Hindu	19.4	38.8	41.8	100.0 (67)
Muslim	15.4	42.3	42.3	100.0 (26)
Christian	33.3	54.6	12.1	100.0 (33)
Type of marriage				
Love	36.5	47.9	15.6	100.0 (263)
Arranged	27.4	44.6	28.0	100.0 (314)
Total	31.5 (182)	46.1 (266)	22.4 (129)	100.0 (577)

Source: Same as Table 2.
Figures in brackets denote the number of respondents.

cussed family planning but reported different times while only 22 per cent of the husbands or wives had never discussed it.

The proportion of husbands and wives reporting identical times for first discussing family planning increased with an increase in the number of living children. Thus, among wives with 0-2 and 5+ children, the percentage reporting identical time of first discussion increased from 32 per cent to 36 per cent (Table 4). At the other extreme, about one-quarter of wives with 0-2 children had never discussed family planning with their husbands, perhaps because they had not achieved their desired fertility. Similarly, among another 23 per cent of wives with five or more children, there had never been any interspousal discussion on family planning.

The percentage of couples reporting identical time of first discussion on family planning also increased linearly with an increase in the age at marriage, but decreased with the current age of the wife; one-quarter of wives over 40 or those who were married before the age of 20, had never discussed family planning with their husbands, perhaps because of their low level of education (Table 4).

Higher education encourages husband-wife communication and thereby discussion on family planning. Only nine per cent of the wives with ten or more years of education had never discussed family planning with their husbands as compared to 29 per cent of those who had no schooling. Among the residence categories, nearly one-half of the wives in the estate sector had never discussed family planning as against only 13 per cent in the urban areas. Since Muslim wives usually have a lower status than their counterparts from other religious groups in Sri Lanka, interspousal discussion on family planning among them was found to be the least; it was highest among Christian wives who are more modernised than any other religious group in Sri Lanka.

Women who had married for love reported a higher level of interspousal discussion on family planning than those who had an arranged marriage. Even though couples who had had an arranged marriage constituted more than half of the total couples in the sample, the practice of parents arranging marriages for their children appears to be diminishing rapidly. Couples who had got married through arrangements made by their parents were new to each other and perhaps had not yet developed the kind of intimacy in which a discussion on family planning would be likely. Thus, they might have felt embarrassed to discuss the question of family planning between themselves.

Decision regarding family planning method to be practised

With the aim of identifying the key decision maker between the husband and wife, those who had used or were currently using contraception were asked as to who had decided the method they would adopt. Among those who had previously used contraception, the decision maker was ascertained by referring to the most recent method of use. The findings are presented in Table 5.

Among those who had used or were currently using contraception, more than half (55 per cent) of the wives said that the decision to use a particular method was a joint one, while about a fourth said that the method choice made by themselves, and a fifth (20 per cent) said that it was their husband's decision. The responses of the husbands suggested a greater level of joint decision making (65 per cent), and an almost similar level of decision making by the husband. However, only 11 per cent of the husbands said that their wives had chosen the contraceptive method, whereas twice as many wives (25 per cent) claimed that they were responsible for selecting it.

The findings thus reveal that in a majority of the cases, the decision to use a particular method of family planning was taken jointly by the couple. However, the pattern also seems to indicate that in Sri Lanka, the husbands wish to be recogni-

TABLE 5
Level of agreement between husband and wife on who decided the method of family planning

Who decided the method used or are using (reported by wife)		Who decided the method used or are using (reported by husband)				Total	%
		Wife	Husband	Both jointly	Doctor/ midwife		
Wife	N	14	16	79	1	110	24.6
	%	12.7	14.5	71.8	1.0	100.0	
Husband	N	9.0	27.0	52.0	-	88	19.6
	%	10.2	30.7	59.1	-	100.0	
Both jointly	N	26.0	58.0	157.0	3.0	244	54.5
	%	10.7	23.8	64.3	1.2	100.0	
Doctor/ midwife	N	-	1.0	5.0	-	6	1.3
	%	-	16.7	83.3	-	100.0	
Total	N	49	102	293	4	448	100.0
	%	10.8	22.8	65.4	1.0	100.0	

Source: Same as Table 2.

sed as the prime decision makers even though they may well have acknowledged joint decision making: thus, when the wife acknowledged herself as the decision maker, her husband wished to report the decision as a joint one (72 per cent), but when she said that the decision was taken by the husband, only 59 per cent of the husbands reported it as a joint one (Table 5).

As indicated in Table 5, the adoption of contraception in Sri Lanka is virtually decided by the couple or either spouse, the involvement of a doctor or midwife or any other person being extremely rare. This clearly indicates that almost all couples in Sri Lanka have a good knowledge of the contraceptive methods available, and can therefore decide which method they wish to use; this contrasts with most South Asian countries where knowledge of contraception is limited.

Out of the 448 ever user wives in the sample, 408 were identified as current users. As estimated from the figures in the main diagonal of Table 5, about 44 per cent of the responses of the husbands and wives on who decided the method of family planning they had used or were currently using, were consistent (Table 6). Wives aged 30-39 years, or with 3-4 living children, or those married at age 20-24, were the most likely to provide the same answers as their husbands. Thus, the highest level of inconsistency was observed among wives aged 40 years or more, or with five or more living children, or those married before the age of 20. Since the majority of these wives were referring to their previous use of contraception, a decision which was made a few years ago, it is natural to expect a higher level of inconsistency between the responses of the husbands and wives as to who decided the method as compared to those who were currently using a method.

The responses of young wives (18-29

TABLE 6
Level of agreement between husband and wife on who decided the method of family planning by selected variables related to the wife

Variable (wife)	Husband's response consistent with that of wife	Husband's response inconsistent with that of wife	Total (N)
Age (years)			
18-29	43.4	56.6	100.0 (99)
30-39	45.8	54.2	100.0 (227)
40+	41.8	58.2	100.0 (122)
No. of living children			
0-2	42.9	57.1	100.0 (140)
3-4	49.5	50.5	100.0 (200)
5+	36.1	63.9	100.0 (108)
Age at marriage (years)			
<20	42.0	58.0	100.0 (169)
20-24	46.9	53.1	100.0 (194)
25+	42.3	57.7	100.0 (85)
Education			
No schooling	40.3	59.7	100.0 (57)
1-5 years	39.4	60.6	100.0 (137)
6-9 years	44.2	55.8	100.0 (163)
10+ years	53.8	46.2	100.0 (91)
Residence			
Urban	43.7	56.3	100.0 (80)
Rural	43.9	56.1	100.0 (321)
Estate	46.8	53.2	100.0 (47)
Religion			
Buddhist	42.2	57.8	100.0 (358)
Hindu	56.1	43.9	100.0 (41)
Muslim	33.3	66.7	100.0 (18)
Christian	58.1	41.9	100.0 (31)
Type of marriage			
Love	43.9	56.1	100.0 (223)
Arranged	44.4	55.6	100.0 (225)
Total (%)	44.2	55.8	100.0
(N)	(198)	(250)	(448)

Source: Same as Table 2.
Figures in brackets denote the number of respondents.

years) and wives with smaller families (0-2 living children) were also very inconsistent. A higher level of inconsistency on fertility desires and behaviour among younger wives or wives with smaller families has been observed in a longitudinal study in Sri Lanka,[22] which is partly related to disagreement with their husbands on wanted fertility; this may well be responsible for the disagreement on who decided the method of contraception in the present study.

Among the socioeconomic variables, education was clearly related to the degree of interspousal communication concerning the choice of the method: better educated (10+ years of schooling) wives had a level of agreement with their husbands about 14 per cent higher than wives with primary or no education (Table 6). Largely because of their lower socioeconomic status, the responses of a smaller proportion of Muslim wives were in agreement (33 per cent) with those of their husbands, while over 58 per cent of Christian wives and 56 per cent of Hindu wives gave identical responses as their husbands. Residence and type of marriage made little difference in the proportions providing identical responses on who decided the method of contraception.

Current use of contraception

Since the husbands and wives (577 couples) in the present sample had been married for three or more years, it is natural to expect a higher level of contraceptive practice among them than among a randomly selected sample of currently married women aged 15-49, irrespective of their marital duration (Table 7).

An interesting finding was that more husbands (81 per cent) reported current use of contraception than did their wives (71 per cent). Many studies have observed that women use fertility regulation without their husbands' knowledge.[23-24] An important determinant of surreptitious regulation may be the woman's expectation that she can successfully hide her behaviour.

Almost one-third of the husbands and wives reported female sterilisation as the current method of contraception, but only 10 per cent of husbands and eight per cent of wives reported male sterilisation. The use of modern temporary methods of contraception is not popular among Sri Lankan couples but a considerable proportion rely on more than one method of contraception. For instance, a combination of withdrawal and rhythm, or the

TABLE 7

Comparison of husband's and wife's responses on current contraceptive use

Method	% currently using		% wives reporting same current use as their husbands
	Husbands	Wives	
Pill	3.8	2.6	63.6 (22)
IUD	3.3	3.5	84.2 (19)
Condom	6.8	3.8	51.3 (39)
Injection	1.4	0.9	62.5 (8)
Female sterilisation	32.6	32.9	95.2 (188)
Male sterilisation	9.7	8.0	78.6 (56)
Withdrawal	14.9	14.1	53.5 (86)
Rhythm	21.5	17.5	56.5 (124)
Abstinence	7.1	3.8	19.5 (41)
All methods	80.6 (577)	70.7 (577)	

The total contraceptive prevalence rate is lower than the sum of method-specific prevalence rates, since persons reporting several methods as current use were counted more than once.
Source: Same as Table 2.
Figures in brackets denote the number of respondents.

condom and rhythm may be used. Therefore, when one partner avoids reporting both the methods they are practising, there will be a disparity in the method specific contraceptive use rates obtained from the responses of the husbands and those of their wives. Thus, the current use rate for all the methods except the IUD and female sterilisation as reported by the husbands was higher than that reported by their spouses. It is likely that some women did not remember or were too embarrassed to report the use of male methods, specifically the condom and withdrawal. On the other hand, it is possible that some husbands may have reported past use of traditional methods as current use, leading to an overestimate of their level of current use as compared with their wives.

Table 7 also presents the percentage of wives reporting the same method of current use as their husbands for each method. As stated earlier, a considerable proportion of the wives were not in agreement with their husbands on this matter. For instance, only 20 per cent of the women whose husbands were practising abstinence reported the same method. This may be so because some of them may not have known that their husbands were doing so for contraceptive purposes. Likewise, over half (54 per cent) of the wives whose husbands stated that they were practising withdrawal, did not report the same method perhaps because of embarrassment at reporting a male method. The same trend can be seen in the case of the condom. However, in contrast to male methods, the most popular contraceptive in Sri Lanka, female sterilisation, was acknowledged by over 95 per cent of the wives along with their husbands.

Summary and Conclusion

Husband-wife communication is considered to be crucial to the adoption of contraception, and is positively correlated with fertility behaviour.

An overwhelming majority of the husbands and wives in the present study had not only thought about practising family planning but also discussed it with each other. However, a higher proportion of wives than husbands had thought about and discussed it; perhaps because women bear the brunt of bearing and rearing children they are more conscious of and concerned about the time and costs involved in bringing up many children, and thus are more motivated to reduce their fertility. A third of the husbands and wives had discussed family planning by the time they had had the first child, that is, in the early stages of family formation, a stage critical to the success of family planning programmes. The overall level of consistency between the husbands' and wives' responses was quite high.

A relatively higher proportion of wives who had not discussed family planning with their husbands were under 30 years of age or had 0-2 living children. The wife's level of education was significantly related to interspousal discussion on family planning: less educated wives were more likely to refrain from such discussions than those with middle or higher education. Perhaps because of their low level of education, wives in the estate sector and Muslim wives reported the lowest levels of interspousal discussion. Wives in arranged marriages were also less likely to have discussed family planning with their husbands than those who had married for love.

While the majority of the couples stated that the choice of method was a joint decision, fewer husbands attributed the decision to their wives than the wives did to themselves. In Sri Lanka, the husband apparently wishes to appear as the prime decision maker even though he acknowledges joint decision making.

Unlike in many Asian countries then, in Sri Lanka, interspousal communication is frequent and highly effective in promoting the adoption of contraception. Even though a considerable proportion of couples still rely on traditional methods, the overwhelming majority of husbands and wives reported current use of contraception with a high degree of consistency and success in spacing and limiting family size.

Higher levels of education and higher socioeconomic status may directly influence discussion and egalitarian decision making in the marital dyad leading, in turn, to more effective contraceptive use. Further efforts to improve the status of women, like increasing their educational levels and employment opportunities are thus called for especially in backward areas. Couples who do not discuss family planning should be well educated on the advantages of interspousal discussion on family matters, therefore family planning programmes should be directed towards them. Male participation in IEC programmes and in service delivery should also be encouraged. Likewise, since a majority of Muslim wives do not discuss family planning with their husbands, IEC programmes should be directed towards these couples with the support of religious leaders to remove some of the sociocultural barriers to contraception. Such attempts should enhance the prevalence of contraception and thereby achieve the target of replacement level of fertility by the year 2001.

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The Indian Woman: Some observations*

Ms Anees Jung

Of the 5.5 billion people in the world, 1.2 billion live in my part of the world, that is South Asia. Nearly half of them are women. "They are half the sky", as the Chinese say. The phrase evokes a sense of wonder and respect, not condescension which, terms like a target group or a minority imply.

I spent a good part of last year travelling in the SAARC region that includes Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, the islands of Maldives and India. To travel in these countries I had to procure visas, exchange money and have my passport stamped at every checkpoint. I was crossing political borders. Borders are lines that distinguish one people from another. In the territory where women live, there are no borders. When I went out and met women, the borders diffused. The seven countries that are today labelled as the SAARC region are like seven sisters, born out of a common root. Arnold Toynbee called it the great Indic civilisation. Divided today, they may seem dissimilar, quarrelling, hating, loving, but finally facing a common destiny. I found the women of this region intelligent, intuitive and strong. A few of them know though that they share one predicament, the fact of being a woman. Inequalities persist everywhere, some more, some less. Women know not that each of their individual dilemmas is a shared one. The moment they do, as they are beginning to, they will become a force. The path of need (which we call in India the *pugdandi*), one that women have begun to make with their own footsteps, will redefine the feminine grid that maps the landscape of South Asia.

I cannot label these women as a target group. Labels are mindsets, an impediment to the perception of a problem. When you look at a target it is outside the person looking at it. No woman is external to a man's life, she is incorporated in it. Any programme that aims to look at women should begin with the study of man himself. Boy and girl are separated not just physically but as ideas. Women also exist should not be the premise. On their existence depends man's life. One needs to approach women with this initial awareness. The word "mankind" has a resonance of separation. One has to look

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at the sheer size of the duality which is ingrained in the word. In our society we have accepted the duality through centuries - the way women eat, dress, behave. This duality is not a dichotomy but a bridge toward wholeness. Once it is accepted, you can work at making it equal. The image of God in ancient Indian mythology is `Ardh-narishwar' - half woman, half God - reinforces and reaffirms this duality, one which is being questioned in the west. Carl Jung who was among the first to adventure searching the source of the soul found the same duality which he referred to as the "anima and animus" in each of us. Much of the western world though is no longer aware of this difference. The surface of the society may appear uni-sexual but the approach to man-woman relationship continues to be dichotomus.

The status women command in all societies today has emerged as a fundamental crisis in human development, heightened by the complex process of modernisation, industrialisation and urbanisation. The disabilities and inequalities imposed on women need to be seen though in the total context of society where large sections of the population both male and female, adults and children, suffer under the oppression of social systems. Any movement for the anticipation of women has to form part of a total movement for change.

For us in India the demand for women's equality grew out of the freedom struggle and the leadership of Mahatma Gandhi whom I call first feminist. This year marks the 125th year of his birth which is being celebrated as the year of tolerance. As far back as 1918, Gandhiji wrote in *Young India*, a magazine he edited: "Woman is the companion of man gifted with equal mental capacities. She has the right to participate in the minutest details of the activities of man and she has the same right to freedom and liberty as he. By sheer force of vicious customs, even the most ignorant and worthless men have been enjoying a superiority over women which they do not deserve or ought not to have". The policy of Satyagraha, or passive resistance that he adopted as his political weapon to win a country's freedom was directly inspired from his observations and insight into woman's capacity for suffering. "Satyagraha", he said, "does not require learning from books but requires a stout heart that comes from suffering and faith". Responding to his call, women from different communities came out to join the freedom struggle, they joined protest marches and demonstrations and worked along with men for economic and social justice. Women who had spent entire lives secluded behind four walls came out, broke oppressive laws, boycotted foreign cloth and liquor shops. Such participation had a direct impact on the attitudes of women themselves and those who perceived them.

Independence brought the promise of actual liberation and equality which even to this day remains a distant objective despite rights enshrined in the constitution. It can be argued through that political equality is meaningless where the mass of population suffers from material poverty, illiteracy, lack of health and burdens imposed by distinctions of class and caste. Gandhiji's call was the starting point to enable the society to transform itself. Perhaps enough heed was not given to his warning not to treat political rights as an end in itself but only as a means. Instead these rights have helped to build an illusion of equality and power.

India gave suffrage to women much before many other countries. The US and UK granted franchise to women only after World War I after decades of struggle. Japan gave them the right in 1946, China in 1949, France in 1944 and Switzerland not until 1971. South Asia was among the first regions in the world to have women as Prime Ministers - Mrs. Indira Gandhi in India and Mrs. Bandaranaike in Sri Lanka. Even today we have Benazir Bhutto in Pakistan and Khaleda Zia in Bangladesh, where even the leader of the opposition is a woman, Sheikh Hasina, daughter of the slain President Mujib Ur Rehman. And yet, both are Islamic countries where women once were supposed to be veiled and secluded. These instances may not be indicators of real status but are symbolic affirmations that cannot be dismissed. For symbols reflect the deep and hidden urges of people.

Democracy has taken root in India, which in my view is our greatest achievement since independence. Successive voting patterns reveal that women are seized with their right to vote, a way they see to help them articulate their silent power. But their ability to produce an impact on the political process has been negligible. Political participation must go beyond electoral and administrative processes, must involve women in any form of organised activity which is beginning to happen in India and the neighbouring countries.

Women today are seen participating in movements, protests and support meetings on all issues connected with labour, dowry, rape, domestic violence, price rise, food adulteration, deforestation, movements for peace. A fine example is the Chipko movement in the hills of North India where simple village women decided to hug the trees and stop them from being cut down. Their non-violent protest had a powerful impact on power brokers, contractors and their own husbands who could not care less if the forest was destroyed while their women had to walk miles to collect fuel and fodder. Much of the political participation today requires information, knowledge and exposure to the various experiments, strategies and models.

In a country where only 39 per cent of the women are literate it would be futile to expect an effective participation. A conscious and deliberate effort has to be made to educate women politically and help them economically. Education has to be an enabling process, one that is not isolated but holistic, that enables women for collective action and helps them solve their own problems. The concept of education needs to be broadened to include empowerment, one that is not targeted to control fertility or to organise labour but to help make the person whole. Only then can one comprehend the total reality. A leaf is not by itself, it is part of a twig, the twig is part of a branch, and the branch merges into the trunk which is rooted in Mother Earth from where shoot out roots in search of water and food and the whole tree is situated in a biosphere of air.

Education has to be holistic and pluralistic and not issues of women separated from those of men. Education is not literacy. Some of the most illiterate people in my country are among the most educated for they have the capacity to integrate the knowledge they have of life with their duties, their responsibilities, their ethics. The education we need has to be a system through which human curiosity is aroused not only about what one already knows about the traditional modes of living but to be able to look at a star and to know what a star is. Human beings in order to survive must have water, must have air, must have health and must have education and culture. Everybody in our government is committed to this ideal. As Shakespeare said: "Even if you do not have virtue but you pretend you have it, you might end up having it".

It was Julian Huxley a distinguished predecessor of Doctor Fredirico Mayor who said: "Science has given to mankind a great deal of knowledge and power. Its duty now is to give humanity a religion". A new vocabulary, a new approach to development needs to be evolved, out of living itself. It cannot be manufactured in secretariats by a team of experts and imposed from above. It cannot be overcome by legislation, but by programmes that aim at changing age-old mindsets, that separate women from men, blacks from whites, east from west. A series of programmes needs to be articulated that dissolve these mindsets, that have an inclusive vision of women, that do not by separating them, isolate them. Whether it is the Judaic tradition, Islamic or Hindu, whether it is Virgin Mary or Mother goddess, they are all images that match. This affirmation that all women emanate can be put to natural use by UNESCO. It needs to identify the place of women in different countries of the world, codify the commonalities and put them together in a common theme. Such a pool of collective wisdom can be packaged for different levels of education starting with the primary.

An unexamined inheritance is a lost one. Media does not understand it, it merely presents it. If it is without living impulses it is not life but mere entertainment. The media must be trained to know it, reflect on it and give it back after interpreting it. A communication programme that reaches the basic level needs to be evolved that is qualitative not quantitative. On the level of UNESCO it would seem to me that mere correction, that is adding and subtracting to what exists already with little readjustments here and there will be more of the same thing and make no difference to what exists already. After a few decades of experience, UNESCO must now be looking for an opportunity to engage in activities that are capable of transforming people in their inner levels which will change the value systems that prevail today and their vision of themselves and the world they inhabit. This will make new individuals out of the old and unless this happens no activity on the old lines will be of any real or lasting value. It may involve innovating a new tongue that aims not at information but also transformation. Only then will resonances change, with not just male sounds but human sounds. I am reminded of a story of an American boy who always talked about his friend. When he was running off one day to invite his friend to his birthday party his mother stopped and asked him "Is your friend black?" "I don't know", the boy said, "I will have to ask him."

Institutions like UNESCO, founded in faith and in hope must unfurl the flag and send a message across the world that will erase the divides and transcend them. It is the only organisation that can and has the mandate to do it.

Acceptance of family planning and linkages with development variables: Evidence from an 80-village study in Orissa

Prof. R.K. Sinha and Prof. Tara Kanitkar

Introduction

The existence of inter-state variations in the acceptance of family planning methods in India is well known. The latest available data also indicate inter-state and inter-district differentials in couple protection rates, as also significant differences in the family planning performance of Primary Health Centres (PHCs) in the same district or state. Scholars and researchers have tried to study the factors associated with such inter-state, inter-district and inter-PHC variations in family planning acceptance. Attempts have also been made to undertake micro level analyses to study the individual factors associated with the acceptance of contraception.

What is less known or less published and even less studied is the phenomenon of inter-village variations in the acceptance of family planning. While analysing the information on the knowledge and practice of family planning methods among currently married women obtained from a large sample survey conducted in Orissa during 1982, it was observed that the practice of various methods of family planning varied markedly between villages. This observation motivated us to undertake the present study primarily with two main objectives in view:

1. To describe inter-village variations in the practice of family planning in Orissa, by the different methods, namely, vasectomy, tubectomy and a group of other spacing methods, such as the IUD, condom, pill and rhythm.
2. To study the factors associated with the differential practice of family planning methods.

Database and sampling design

The data used for the study was collected in a baseline survey of Orissa conducted by the International Institute for Population Sciences, Bombay in 1982. The districts covered in the survey, namely Cuttack, Ganjam, Kalahandi, Phulbani and Puri, were selected by the Governments of India and Orissa for developing

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infrastructure and providing health, family planning, and maternal and child health services. The five districts were geographically contiguous but heterogenous in terms of socioeconomic development. The action programme in Orissa was partially funded by the Overseas Development Administration (ODA), U.K.

The sampling design for the baseline survey was primarily developed to provide independent and statistically reliable estimates from villages with PHCs or Sub-centres referred to as Stratum I villages, and villages without any such health facilities, referred to as Stratum II villages. This involved the adoption of a two-stage stratified sampling design in which a specified number of villages were selected from each stratum of the selected district in the first stage. Thus, 16 villages were selected from each district: four from Stratum I and twelve from Stratum II, giving a total of 80 villages from the five districts. A random sample of 50 households was then selected for interview from each of these villages by probability proportional to size (PPS) in order to maximise the spread of the sample villages over different size classes of villages, and to improve the efficiency of the estimates. Such a stratified sampling scheme was adopted in order to ascertain whether the provision of health facilities does or does not make a difference to the morbidity, mortality, health conditions and practice of family planning in the population.

Analysis

In the individual level survey, data on knowledge and practice of various contraceptive methods were collected from currently married women in the selected households. The other set of data involved village level information collected for each of the villages by canvassing a village schedule in each village. This included information on infrastructural facilities, educational facilities, health facilities, mass media and other communication facilities, and other facilities such as banks, post-offices, veterinary dispensaries, fair-price shops, cinema theatres, weekly bazaars and so on. Using the available information, a composite village level index (VLI) indicative of that the overall developmental status of the village was prepared. The index takes into consideration a number of items for which information was collected during the study. These items have been grouped under eight major categories as described below:

1. *Infrastructural facilities:* (a) transportation facilities e.g. distance from the village to the nearest bus stand or railway station or pucca road; whether connected by all weather roads etc. (b) the availability of various other facilities in the village such as electricity, bank, co-operative credit society, post office, periodic bazaars/markets/shops or fair price shops etc.
2. *Educational facilities* such as a primary school, middle school, high school, college, adult education classes and other educational facilities.
3. *Health facilities* such as a hospital, dispensary, doctors, trained dai(s), as well as the distance from the village to a PHC or Sub-centre, the availability of safe drinking water and so on.
4. *Mass media and communication facilities* such as cinema houses, number of households getting newspapers regularly, having radio sets/transistors.
5. *Accessibility to government infrastructure* in terms of distance from the village in kilometres to the Block Headquarters and Tehsil Headquarters.
6. *Agricultural development* indicators such as the availability of electricity for irrigation, fertiliser depots, im-

proved seed depots, farm-housing and storage, number of tractors/threshers/source of irrigation, veterinary dispensary etc.

7. *Economic condition and industry-related indicators* such as the existence of large and/or small industrial units, etc.
8. *IEC activities/other educational activities for health and family welfare* carried out during the last one year such as film shows, exhibitions, dance/drama shows, group meetings, Field Worker/Health Worker visits, orientation training camps, posters distributed etc.

The score of each item under the eight categories ranged from 0 to 2 and the composite index (VLI) ranged from 0-80. The score was observed to range between 7 and 59. The VLI scores were graded into four groups. A grade-wise distribution of the villages is presented below.

Grade	Score	No. of villages
I	7-20	25 (31.3)
II	21-30	24 (30.0)
III	31-38	20 (25.0)
IV	39-59	11 (13.8)

Mean = 26.8; S.D. = 10.7
Co-efficient of variation = 39.9
The figures in brackets denote percentages.

The average VLI score was 26.8 with a standard deviation of 10.7 and co-efficient of variation of 40 per cent, indicating the heterogenous development levels of the villages.

Acceptance of family planning methods

The data on acceptance of family planning analysed for the present study refers to 3,627 currently married women from the 80 villages. The percentage distribution of family planning acceptance by district, stratum, and by permanent and spacing methods is presented in Table 1, and indicates district-wise differentials in family planning acceptance.

Panel A of the table indicates that the percentage of currently married women practising family planning ranged from about 17 in Phulbani district to about 31 in Cuttack and Puri districts.

Panel B of Table 1 presents family planning acceptance by the respondents by stratum. Nearly 28 per cent of the currently married women in Stratum I villages, that is villages with health centres, were practising family planning; the corresponding percentage in Stratum II villages was lower - around 25 per cent. However, the difference between the two categories of villages was very small and statistically insignificant.

About 26 per cent of the 3,627 currently married women were ever users of family planning (Panel C, Table 1), the break-up being 11.5 per cent tubectomy acceptors; 6.4 per cent vasectomy acceptors (husbands) and the remaining 7.8 per cent users of spacing methods (condom, IUD, oral pills, rhythm, etc.). The findings also show substantial inter-village variations in contraceptive use (co-efficient of variation = 48.3 per cent). The largest variation (co-efficient of variation about 73 per cent) was found in the case of ever users of spacing methods as compared to those who had accepted sterilisation (co-efficient of variation about 56 per cent).

Factors associated with variations

The questions addressed aim at exploring the relationship, if any, between the acceptance of family planning and a set of development related variables at village level, and to determine the quantitative contribution, if any, of the predictor variables in explaining the observed variations in the acceptance of family planning methods.

TABLE 1
Acceptance of family planning methods: Orissa, 1982

	Average acceptance		S.D.	Co-efficient of variation	No. of villages	No. of currently married women
	Range	%				
A. *By District*						
Cuttack	(15.1-41.7)	31.3	9.6	29.5	16	773
Ganjam	(8.3-48.7)	23.8	12.6	51.3	16	663
Kalahandi	(4.6-46.7)	25.4	12.6	51.1	16	732
Phulbani	(2.3-39.5)	17.1	11.5	72.9	16	670
Puri	(18.8-58.3)	30.9	10.8	34.0	16	789
All Districts	*(2.3-58.3)*	*25.7*	*12.4*	*48.3*	*80*	*3627*
B. *By Stratum*						
Stratum I (villages with health centres)		28.2	12.0	42.5	20	889
Stratum II (villages without health centres)		24.9	12.3	49.4	60	2728
C. *By Method*						
Sterilisation		17.9	10.0	55.9	80	3627
Spacing methods (IUD, condom, pill)		7.8	5.7	73.1	80	3627
All methods		25.7	12.4	48.3	80	3627

The above questions were addressed by performing a zero order correlation analysis with all the eight village level development indicators and the composite village level index (VLI). The correlation between acceptance of family planning methods and the set of village level variables were examined at three levels separately: with total acceptors of sterilisation (males and females), with acceptors of spacing methods, and finally with all acceptors including sterilisation. The results of this analysis are presented in Table 2.

Among the eight development related variables only four were observed to be significantly correlated with the acceptance of sterilisation, six with the acceptance of spacing methods, and five with the acceptance of all methods. The four village level variables namely, infrastructure, education, health and mass media and communication facilities exhibited a significant and uniform correlation at each level of acceptance. No significant correlation was evident with variables such as accessibility to Government infrastructure, or economic condition and industrial development. Further, among all the variables, education and mass media/ communication facilities were highly and significantly correlated (P = 0.00) with the acceptance of spacing as well as all methods. The composite village level indicator (VLI) exhibited a similar correlation with the acceptance of both spacing and all methods.

The correlation analysis perhaps suggests that the acceptors of spacing methods are significantly correlated with village level development indicators than those of sterilisation. This prompted further analysis of village level data and the analysis of variance (ANOVA) was performed to isolate the effects of individual village indicators on the acceptance of sterilisation and spacing methods[1]. The analysis was carried out with the village

TABLE 2
Correlation between acceptance of sterilisation, spacing and all methods, and village level development indicators, Orissa, 1982

Village level indicators	Acceptors of sterilisation	Acceptors of spacing methods	Acceptors of all methods
Infrastructural facilities	0.259*	0.260*	0.330*
Educational facilities	0.308*	0.406**	0.437**
Health facilities	0.261*	0.275*	0.338*
Mass-media & communcation facilities	0.331*	0.335*	0.422**
Accessibility to Government infrastructure	0.043	0.045	0.056
Agricultural development	0.170	0.301**	0.306*
Economic condition and industries	0.153	0.132	0.185
Mass-media and other education activities for health & FP during last one year	0.085	0.267*	0.191
Composite Village Index	0.308**	0.379**	0.424**
Per cent literate	0.164	0.522**	0.373**
Electricity (domestic use)	0.184	0.381**	0.324*

* Significant at <= 0.01 level.
** Significant at 0.00 level.

as a unit of analysis, adopting the techniques of Multiple Classification Analysis (MCA) and Hierarchical Analysis of Covariance.

In the analysis, percentage acceptors of sterilisation, spacing methods, and all methods were considered separately as dependent variables. A set of five predictor variables was chosen from among the village level development indicators, namely, infrastructure, education, health, and mass media and communication which had shown significant and high correlations. The selected predictor variables were: (i) composite village index; (ii) electricity for domestic use; (iii) percentage literate; (iv) existence of a PHC/ Sub-centre; and (v) the number of radio sets. These variables reflect the development impact upon villages at aggregate levels and were considered to be the most important in each indicator category. The composite index for each village (VLI) was included as an overall indicator of the developmental status of the village.

The ANOVA analysis was carried out separately with the dependent variables - percentage acceptance of sterilisation, percentage acceptance of spacing methods, and percentage acceptance of all methods with the five predictor variables, and gave some interesting findings. The major finding was that while variations in the acceptance of sterilisation could not be explained significantly by any of the predictor variables, it was not so in the case of spacing methods. Table 3 presents the results of the analysis of variance.

It is evident from Panel A of Table 3 that with spacing methods as the dependent variable, the F values for at least two variables, that is, the composite village index (VLI) and the percentage literate were highly significant (P <= 0.01). Further, electricity (domestic) was also significantly related, though to a lesser extent (P <= 0.05). The other two variables, namely health and media facilities were not significant even at a five per cent level. Nearly half (21.2) of the total varia-

TABLE 3
Analysis of variance of contraceptive method use and village level development indicators, Orissa 1982

Predictor variables for	Sum of Squares	D.F.	Mean Square	F Ratio	Significance	Partial R^2
A. *Spacing methods*						
1. Composite index	407 47	2	135.91	6.33	0.001	15.97
2. % literate	540.49	4	135.12	6.29	0 000	21.17
3. PHC/Sub-centre	0.12	1	0.12	0.001	0.941	0.00
4. Electricity (domestic)	118.37	1	118.38	5.51	0.022	4.64
5. No. of radios	47.75	1	23.88	1.11	0.335	1.87
Explained	1114.47	9	101.32	4.71	0.000	
Residual	1438.42	70	21.47			
Total	*2552.89*	*79*	*32.73*			
B. *Sterilisation*						
1. Composite index	476.79	2	158.93	1.68	0.179	6.47
2. % literate	333.96	4	83.49	0.88	0.478	4.53
3. PHC/Sub-centre	12.63	1	12.63	0.13	0.716	0.17
4. Electricity (domestic)	10.40	1	10.40	0.11	0.741	0.14
5. No. of radios	209.63	1	104.82	1.11	0.336	2.84
Explained	1043.41	9	94.86	1 00	0.452	
Residual	6327 55	70	94.44			
Total	*7370.95*	*79*	*94.50*			

tion of 43.7 per cent was explained by the literacy status of the villages and about 30 per cent by the composite village level index. The remaining 20 per cent was explained by the availability of electricity and radios in the village. It is strange that the existence of PHC/Sub-centre facilities in the villages did not contribute at all to the variations in acceptance. In the case of sterilisation, however, none of the predictors were significant (Panel B, Table 3). The findings thus suggest that variations in the acceptance of sterilisation are unlikely to have significant linkages with socioeconomic or development-related variables but those related to the acceptance of spacing methods would be influenced by development.

Table 4 shows the deviation from the grand mean taking into consideration the unadjusted effects and adjusted effects of the predictors on the use of spacing methods. The table also provides the common correlation ratios which are associated with the set of unadjusted category effects for each factor, denoted as Eta coefficients, which indicate gross effects. Moreover, there is a partial correlation ratio, denoted as the Beta co-efficient, which is the adjusted effect and indicates the net effect.

The effect of aggregate level variables such as VLI or the percentage literate showed an expected pattern when unadjusted and adjusted means of percentage acceptors of spacing methods were considered. The unadjusted mean for low scoring villages (VLI) was 6.1 and for high scoring villages was 10.7, indicating a difference of 4.6 on a percentage scale.

TABLE 4
Relation between acceptors of spacing methods and village level indicators, Orissa, 1982

Grand mean of dependent variables = 7.81

Predictor variables	No. of cases	Unadjusted (Eta)	Adjusted for independents (Beta)
Composite Village Index			
Low score	25	- 1.72	- 0.65
Medium score	24	- 1.82	- 1.05
High score	31	2.89	0.94
		(0.40)	(0.13)
Percentage literate			
5 to 14%	10	- 2.72	- 2.89
15 to 25%	17	- 3.18	- 2.94
25 to 40%	20	- 2.29	- 1.92
40 to 50%	19	2 78	2.74
50 to 70%	14	5.14	4.52
		(0.58)	(0.53)
PHC/Sub-Centre			
Yes	20	0.65	- 0.11
No	60	- 0.21	0.03
		(0.06)	(0.01)
Electricity (domestic)			
Yes	53	1.59	1.37
No	27	- 3.05	- 2.63
		(0.39)	(0.33)
No. of radio sets			
Very few (<50)	64	- 0.29	0.10
High	16	1.47	- 0.49
		(0.11)	(0.04)

Multiple R^2 = 0.431
Multiple R = 0.661

When the adjusted means were considered, the mean value for the low score villages improved upwards to 8.5 while that for the high score villages moved downward to 8.75, thus reducing the differences between the categories. The Eta value was found to be high (0.40) which decreased (0.13) when adjusted for the preceding variable. Similarly, an examination of the category means for other significant variables, indicates Eta values of 5.1 and 12.95 for villages with the least and highest literacy levels respectively, in the unadjusted category. After controlling the effects of the preceding variable, i.e. VLI, the respective values were 4.9 and 12.3, thus reducing the differences between the category means. The Eta value was quite high (0.58) and decreased slightly (0.53) when adjustments were allowed. The explanatory power of the composite village index and percentage literate was quite high even after adjustment for the previous variable.

The finding that the variables - percent literate in the village and the village level index - do not show any association with the acceptance of sterilisation but are significantly related to the acceptance of spacing methods is neither surprising nor unexpected. Perhaps this is because sterilisation is a one-time method, requires only one-time motivation and is aggressively promoted by programme managers. It is also independent of the acceptor's literacy or educational attainment. On the contrary, the acceptance of spacing methods takes into account the motivational aspect and hence, is not independent of literacy or educational attainment of the individual. The finding of this study thus clearly brings out the importance of aggregate level development related variables and education, if spacing methods are to be promoted.

Summary and policy implications

The foregoing analysis provides evidence of village level variations in the acceptance of family planning methods, grouped broadly as terminal and spacing methods, in Orissa. While variations in the acceptance of terminal methods could not be explained by the selected predictor variables which included a number of socioeconomic development related variables, they were able to significantly explain variations in spacing method acceptance, specifically by the literacy status of the village and its overall development as expressed by a composite village level index.

In terms of quantitative assessment, nearly half of total variation in acceptance of spacing methods was contributed by the literacy status of the villages and about one-third by the composite village level index. It is indeed interesting that the existence of PHC/Sub-centre facilities in the villages did not have any impact on the acceptance of spacing methods. These findings are neither surprising nor unexpected in view of the fact that sterilisation is a one-time method requiring only one-time motivation, is vigourously promoted by programme managers, and is independent of the acceptor's literacy or educational attainment. This is not always true of spacing methods which require sustained motivation and continued use on the part of the acceptor. Our results thus suggest that if spacing methods are to be promoted, aggregate level variables that determine the socioeconomic status of villages are important and need to be improved.

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Contraceptive behaviour in women carrying an unwanted pregnancy

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Introduction

In developing countries, deep-rooted beliefs, customs and superstitions regarding pregnancy, child birth, diet, health and the role of the mother are still widely prevalent. In these regions, socioeconomic conditions are poor, and women are most vulnerable to the health risks associated with bearing many children in quick succession. Pregnancy and breastfeeding make heavy nutritional demands that women from poor homes are seldom able to meet. All these factors contribute to high rates of maternal morbidity and mortality.

The reduction of maternal and infant mortality is a major goal of both the WHO and UNICEF as part of the strategy of 'Health for All' and the Safe Motherhood and Child Survival Initiative. This can be achieved by effective and efficient maternal care and the voluntary adoption of the small family norm by couples. Family planning plays a crucial role in safeguarding the health of women, particularly in developing countries where they are often forced to carry an unplanned and unwanted pregnancy. This study was conducted in the labour ward of one of the units of the Department of Obstetrics and Gynaecology of the J.N. Medical College Hospital, Aligarh in the state of Uttar Pradesh, with the intention of determining prior contraceptive use among a group of pregnant women, to assess the number of unplanned pregnancies, and the reasons leading to them.

Observations and Discussion

The study sample included 725 pregnant women who had delivered at the J.N. Medical College Hospital, Aligarh. The women were interviewed using a pretested proforma in order to elicit their desire for the current pregnancy. A detailed history of contraceptive use prior to the pregnancy, the reasons for continuing the pregnancy, if unplanned; and the desire to practice contraception following childbirth, were also recorded.

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Desire for present pregnancy

Table 1 gives a distribution of the women by their desire for their current pregnancy. Of the 725 women who had registered, almost half (48 per cent) stated that the pregnancy was planned, about two-fifths (41 per cent) said that it was unplanned but not unwanted (they had accepted it), and just over a tenth (11 per cent) considered the pregnancy as unwanted.

TABLE 1

Distribution of women by desire for current pregnancy

	Rural	Urban	Total
Planned	102(38.7)	245(53.0)	347(47.9)
Unplanned	126(47.9)	171(37.1)	297(40.9)
Unwanted	35(13.4)	46(9.9)	81(11.2)
Total	263 (100.0)	462(100.)	725(100.0)

X2 = 13.56; p = < 0 01

The figures in brackets denote percentages.

More planned pregnancies were reported by urban women (53 per cent) as compared to rural women (39 per cent), while the reverse was true in the case of unplanned pregnancies: 13 per cent and 10 per cent among rural and urban women respectively. These observations were statistically significant.

The reasons for accepting an unplanned pregnancy were:

1. The woman was nulliparous, had conceived soon after marriage, and was persuaded by the relatives or medical personnel to continue the pregnancy.
2.. There was a gap of more than two years between the current pregnancy and the previous childbirth.
3. The woman had a small family of one or two children and preferred to have a third baby instead of terminating the pregnancy due to fear.
4. The desire for a male or a female child where all the other siblings in the family were of the opposite sex.
5. Religious grounds and strong religious beliefs of either self, husband or in-laws towards termination of pregnancy or contraception, as they believed pregnancy to be a "gift of God".

Though women are generally in favour of family planning, its acceptance is low, especially in rural areas. Their attitude is influenced by a number of factors such as religion, economic status, occupation, education, and the number of living children besides family customs, beliefs and traditions. For example, Deborah[1] observed that proportions of women who did not want a pregnancy and yet did not practice any contraception ranged from 45 per cent in Egypt to 85 per cent in Lesotho; the average being 74.0 per cent. Kumar[2] cites a WHO study which reports that 90 per cent of women preferred fewer children and longer intervals between them but most either did not have the means or the freedom to exercise their rights.

Reasons for continuing an unwanted pregnancy

All the 81 women who reported an unwanted pregnancy in our study were asked why they wished to continue the pregnancy. The reasons advanced by both urban and rural women as shown in Table 2 were more or less similar. The main reasons were: religious grounds (rural women: 37 per cent; urban women: 48 per cent), and fear of termination methods (rural women: 20 per cent; urban women: 17 per cent). Surprisingly, about 14 per cent of rural and 13 per cent of urban women were ignorant about the medical termination of pregnancy or MTP facility (Table 2).

The fear of pregnancy termination methods was mainly associated with so-

TABLE 2
Distribution of women by reason for continuing the unwanted pregnancy

	Rural	Urban	Total
Fear of termination methods	7 (20.0)	8 (17.4)	15 (18.5)
Lack of facility for termination	6 (17.1)	—	6 (7.4)
Hostility of in-laws/husband to MTP onreligious grounds/ misbelief	13 (37.2)	21 (45.7)	34 (42.0)
Termination refused by medical personnel due to large size of uterus	4 (11.4)	11 (23.9)	15 (18.5)
Ignorance of MTP facilities	5 (14.3)	6 (13.1)	11 (13.6)
Total	35 (100.0)	46 (100.0)	81 (100.0)

The figures in brackets denote percentages.

cial factors. Such factors included the fear of being divorced; a conviction that such an act would debar them from heaven; the fear of incurring the 'curse of God'; and the fear of infertility, infection or death. These fears were predominantly greater among multiparous Muslim as compared to Hindu women in both rural and urban areas. Further, the joint family was found to have a greater influence on the continuation of an unwanted pregnancy.

Twice as many urban as rural women (rural: 11.4 per cent; urban: 23.9 per cent) (Table 2) were refused a medical termination of pregnancy by medical personnel. This was due to late diagnosis of pregnancy either because the woman had conceived during the period of lactational amenorrhoea or had detected the pregnancy after she had felt the foetal movements, or due to irregular use of contraception and late suspicion of pregnancy. In a few cases, the delay was due to the failure to diagnose pregnancy early by a junior doctor. Table 3 looks at the contraceptive status of the women prior to the pregnancy in question.

Of the 725 women, as many as two-fifths (61.5 per cent) had not used any contraceptive prior to the pregnancy whereas the remaining 38.5 per cent had done so. However, among the latter group, only a quarter (25.4 per cent) were regular users and almost three-quarters had used a contraceptive regularly (Table 3) indicating thereby that acceptance including the correct use of the contraceptive method was rather poor. Further, there was a heavy reliance on the condom (used by 68 per cent of regular and 88 per cent of irregular users), and a tenth of all users practised the rhythm or coitus interruptus. During the interview, almost two-fifths (59.2 per cent) of the women stated that they would adopt some form of contraception after the current delivery. Among them, a third (32.9 per cent) desired to limit their family size and the remaining (67.1 per cent) wished to space births (Table 4).

Most of the remaining (40.8 per cent) women who did not want to use a contraceptive after their current delivery, said that they would like to plan their families but were afraid as their husbands and mothers-in-law were against family planning. If this hostility is removed through proper education and counselling of the couple, especially the husband, a larger number of pregnancies could be averted by the voluntary use of contraception.

TABLE 3
Distribution of women by contraceptive use prior to current pregnancy

Method	Regular use		Irregular use		Total
	Rural	Urban	Rural	Urban	
Rhythm	-	4 (40.0) [6.9]	-	6 (60.0) [3.9]	10 (100.0) [3.6]
Coitus interruptus	-	3 (16.7) [5.2]	7 (38.9) [12.5]	8 (44.4) [5.3]	18 (100.0) [6.5]
Condom	10 (4.3) [76.9]	38 (16.5) [65.5]	49 (21.2) [87.5]	134 (58.0) [88.2]	231 (100.0) [82.8]
IUD	3 (20.0) [23.1]	12 (80.0) [20.7]	-	-	15 (100.0) [5.3]
Oral Pill	-	-	-	4 (100.0) [2.6]	4 (100.0) [1.4]
Tubectomy	-	1 (100.0) [1.7]	-	-	1 (100.0) [0.4]
Total	13 (4.7) [100.0]	58 (20.7) [100.0]	56 (20.1) [100.0]	152 (54.5) [100.0]	279 (100.0) [100.0]

Non-users: Rural: 194; Urban: 252

The figures in ( ) and [ ] brackets denote row-wise and column-wise percentages respectively.

TABLE 4
Distribution of women by desire to use contraception to space or limit births postpartum

Method	For spacing births		For limiting births		Total
	Rural	Urban	Rural	Urban	
Condom	35 (17.1) [54.7]	92 (44.9) [41.1]	11 (5.4) [44.0]	67 (32.6) [57.8]	205 (100.0) [47.8]
IUD	9 (12.0) [14.0]	46 (61.3) [20.5]	8 (10.7) [32.0]	12 (16.0) [10.3]	75 (100.0) [17.5]
Oral Pill	-	-	1 (100.0) [4.0]	-	1 (100.0) [0.2]
Tubectomy	-	-	5 (27.8) [20.0]	13 (72.2) [11.2]	18 (100.0) [4.2]
Traditional methods*	20 (15.4) [31.3]	86 (66.2) [38.4]	-	24 (18.4) [20.7]	130 (100.0) [30.3]
Total	64 (14.9) [100.0]	224 (52.2) [100.0]	25 (5. [100.0]	116 (27.1) [100.0]	429 (100.0) [100.0]

Will not practise FP: 296 (Urban: 174; Rural: 122)

* Rhythm or coitus interruptus.

The figures in ( ) and [ ] brackets denote row-wise and column-wise percentages respectively.

Conclusion

Our findings indicate that over a tenth of the 725 pregnancies were unplanned and two-fifths were unplanned but accepted. This shows that over half (52 per cent) of the pregnancies were unplanned and significantly higher among rural as compared to urban women. These, if prevented, would have helped improve the health of the mother and her family, failing which they would lay a heavier burden on the already busy antenatal clinics and on families struggling desperately to maintain a decent standard of living. Preventing such unwanted pregnancies then would not only help attain the goal of 'Health for All' by improving the health and survival of mothers and children, but would help reduce the birth rate considerably. Further, only 38 per cent of the women were practising family planning prior to the current pregnancy, and only a quarter were doing so regularly.

The main reasons advanced by both rural and urban women who wished to continue the pregnancy were related to religion and fear of termination of pregnancy, though about 13-14 per cent were not aware of MTP facilities. The high proportion of unplanned pregnancies, the low and/or irregular use of contraceptives by the women prior to the current pregnancy, and the finding that about 60 per cent of the women who had an unplanned pregnancy wished to space or limit their families following the current delivery and most of the others expressed a desire to do so but were afraid of their husbands and/or mothers-in-law, points to the need for strengthening the IEC component of the programme to remove misconceptions as also the underlying socio-cultural barriers.

A rural woman is more likely to remain neglected during pregnancy and childbirth as she is at a higher risk than a woman living in an urban area. Providing treatment for complications related to pregnancy and childbirth is not enough to ensure maternal health. It is equally important to tackle other factors such as illiteracy, poverty, malnutrition, gender discrimination, and superstitions and false beliefs regarding contraception. These are issues which persist even after the birth of the first child. Unless these non-medical social factors are brought under control, the goal of 'Health for All' by the year 2000 A.D. will remain remote.

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Differential acceptance of family planning methods in a high performance district in Karnataka

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Introduction

Mandya district in Karnataka state has achieved the highest couple protection rate (55 per cent)[1] in the state, and an annual population growth rate of 1.36 per cent (during 1981-91) as compared to the state averages of 43 and 1.88 per cent, respectively[2]. In fact, since the last two decades, the district has been surpassing its annual target by 40 per cent and registering a couple protection rate higher than the state average[3]. The high performance of family planning in Mandya is noteworthy in view of the fact that the district is either below or at par with the state average with regard to many indicators of socioeconomic development, except agriculture and related activities. The lower population growth rate of Mandya district has been attributed primarily to the high acceptance of family planning[4] than to a higher female age at marriage and female education which are considered to be positively associated with general socioeconomic development.

Given a socioeconomic disparity in favour of the state and a family planning performance in favour of the district, it was considered worthwhile to investigate the differentials in acceptance of family planning methods in the district with respect to coverage of maternal and child health services and son preference. Such an analysis was expected to provide an understanding of the extent of coverage of family planning and maternal and child health programmes in the community on the one hand, and the community's response to these programmes on the other. An investigation of this type, it was believed, would throw some light on the success of the family planning programme in a sub-region despite poor socioeconomic development. In addition, it would enable one to predict the progress of the family planning programme in the coming years. This paper then proposes to study the influence of the following on the high acceptance of family planning in Mandya:

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1. selected but crucial household and individual characteristics of family planning acceptors;
2. the cultural preference for sons, and
3. MCH services provided by the health personnel.

Study sample

The study is based on a rural sample of 644 currently married women of 15-49 years of age having at least one living child at the time of the survey. The restriction of a minimum of one living child was imposed in order to narrow the focus on potential acceptors of spacing methods. Further, it has often been documented that the practice of family planning between marriage and first birth is rare, and so also the practice of spacing in general is negligible in rural communities. Mandya district is not an exception to this phenomenon.

The respondents were drawn from 14 villages and three talukas with varying degrees of irrigation facilities to represent the rural population of the district. Field research was done during December 1991 to April 1992 and the data were collected by experienced interviewers through a structured schedule.

Socioeconomic profile of Mandya district

In 1989-90, the per capita income in Mandya district was as low as Rs. 3,900 as compared to the state average of Rs. 4,305[5]. Female literacy was lower than the state average of 37 per cent in 1991 by six percentage points[6]. Further, the average age at marriage of girls was also one year less than the state average of 19.4 years; so also, the difference between the average age at marriage of males and females was 7.5 years as compared to 6.5 years in the state as a whole[7].

In addition to the above socioeconomic disparities between Mandya district and Karnataka state, the population of the former is highly concentrated in smaller villages in a small geographic area. Since 1901, Mandya's population density has been 50 per cent higher than that of the state. In 1991, it had about 327 persons per square kilometre as compared to 234 in the state[2]. This is attributed to natural endowments which favour agriculture as well as to the subsequent expansion of irrigation facilities[8]. The population is also highly homogenous in terms of religion, caste and language. About 95 per cent is Hindu (state average: 86 per cent[9]), 91 per cent speaks Kannada (state average: 65 per cent)[10], over 60 per cent belongs to the Vokkaliga caste[11] and Gangadikara subcaste[12].

Historically, Mandya has been predominated by small and medium farmers. Therefore, land fragmentation has reached its limit due to division of land over generations; further division will make it difficult for the owner-cultivator to survive on farm income only. In 1985-86, the smallest land holding of less than one hectare constituted 69 per cent of the total holdings in the district as compared to 36 per cent in the state[5]. Since the district is dominated by small farmers, economic disparity is also not as high as one would expect in the state.

By 1988-89, almost 36 per cent of the total cultivable land in Mandya had been irrigated as against only 14 per cent in the state; sugar-cane and paddy cultivation had reached 10 and 23 per cent respectively, of the total cultivable area (corresponding state figures were as low as 2 and 10 per cent respectively[5]). Over the years, with the commercialisation of sugarcane cultivation and the establishment of agro-based industries in the district,[13] the share of the district's agricultural income to its total income has decreased from 72 per cent in 1970[14] to 52 per cent in

1989-90[5]. However, despite this, population dependency on agriculture remains high (the contribution of the state agricultural sector to the total state income was 34 per cent). Further, the 1991 census revealed that 84 per cent of all rural male workers and 26 per cent of all urban male workers were engaged in cultivation and agricultural labour as compared to the state averages of 77 and 12 per cent, respectively[15].

Due to the expansion of irrigation facilities, transport and communication facilities have developed faster in the district, than in the state. The district thus has a good network of roads and all villages are connected at least with a *kachcha* road.[13] Therefore, though health infrastructure facilities were similar in the district and the state,[16] they were more accessible: in 1984, medical facilities were available within a distance of five kilometers from 65 per cent of the villages and within 5-10 kilometers from another 29 per cent[13]. These relative advantages in the district, combined with the compactness of the villages (small villages with a high population density),[17] might have facilitated the health personnel at the periphery to render their services better besides increasing the accessibility of these services.

Results

Table 1 presents the acceptance of family planning methods by household and individual characteristics of the respondents. Overall, about 71 per cent of all women were using a family planning method with sterilisation accounting for as much as 97 per cent of the method use. Family planning acceptance in the study population was higher than the official figure of 55 per cent because women with at least one living child were selected. In general, the differentials in acceptance were not large and were reduced further when accounted for age variations (data not presented).

Household characteristics

As indicated in Table 1, family planning was more likely to be accepted in a nuclear family setting (77.0 per cent) than in other family types. This is perhaps because women in nuclear families may often not get the required help from other female relatives at the time of delivery and so on, and therefore are more likely to regulate family size.

TABLE 1

Differentials in family planning acceptance by household and individual characteristics

Household characteristics	Per cent acceptors	Number of respondents
Family type		
Nuclear	77.0	373
Couple + ever married female relative	65.0	232
Other	53.8	39
Caste		
Vokkaliga	73.7	324
Scheduled caste/tribe	61.3	152
Other	75.8	153
Main source of household income		
Agriculture	72.5	324
Labour	70.6	214
Trade/employment	80.2	72
Other	44.1	34
Age of wife (years)		
Less than 19	25.0	60
20-24	59.3	177
25-29	74.5	161
30-34	92.6	122
35-39	84.5	84
40-49	82.5	40
Education of wife		
Illiterate	72.2	425
Primary (1-4 years)	77.6	76
Middle (5-7 years)	70.4	98
High school and above	46.7	45
Occupation of wife		
Housewife only	60.5	220
Agriculture	80.1	201
Labour	72.6	201
Other	86.4	22
Total	71.3	644

Though 61 per cent of the scheduled caste/tribe respondents had accepted family planning, it was less than that of the Vokkaligas or other castes (around 75 per cent). Household income was approximated by the main source of income to minimise any response errors in reporting household income and also because it is difficult to derive household income from multiple sources. The differentials in acceptance were not large among the major categories of household income and the number of respondents in the 'other' category was very small to draw any inference.

Individual characteristics

As expected, acceptance of family planning increased with the respondent's age up to 34 years and declined thereafter (Table 1). What is worth noting is the high rate of acceptance even at younger ages. About a quarter of the women below 20 years of age had accepted a method, the corresponding figures for higher age groups rose to 59 per cent in the 20-24 age group, 75.0 per cent in the 25-29 age group and 93.0 per cent in 30-34 age group. However, acceptance rates continued to remain high in the older age groups around 85.0 per cent in those aged 35 years and above, suggesting the influence of other variables, mainly son preference as indicated in Table 2.

Over 70.0 per cent of the respondents in all the educational categories, except high school and above, represented by a small number of women, had accepted family planning (Table 1). This observation contradicts the generally established positive association between educational level and acceptance rate. However, this reversal in trend is due to a very strong preference for sons among literate women as seen in Table 2.

Occupation wise, acceptance was higher (over 70 per cent) when the woman was engaged in other work in addition to household chores (60 per cent). In this regard, the woman's role as a mother appears to compete with her economic activity resulting in a higher acceptance of family planning. Again, as Table 2 indicates, it is partially also due to son preference.

An important observation that can be made from the foregoing analysis is that family planning acceptance is high when women live in nuclear families and when they are engaged in economic activity. This may be due to the fact that women living in nuclear families are unable to cope with household chores and agricultural work on the one hand and the burden of bearing and rearing children on the other. Therefore, one should study the work schedule of women living in different types of family settings in order to understand the role of the family in her fertility decision making.

Preference for sons

In this sub section, only sterilisation acceptors have been included in the analysis as acceptors of temporary methods were very few in number. Of the total 459 acceptors, 445 had accepted sterilisation and the remaining 14 were using a temporary method, largely the IUD. Table 2 presents the average number of male and female living children by household and individual characteristics for acceptors and non-acceptors separately.

On an average, acceptors of sterilisation had 3.0 and non-acceptors had 1.9 living children. While the average number of female living children was more or less similar among acceptors and non-acceptors with regard to the various characteristics studied, the average number of male living children was twice as high among acceptors as compared to non-acceptors

TABLE 2
Distribution of acceptors and non-acceptors by average number of male and female living children

Household & individual characteristics	Acceptors			Non-acceptors		
	Male	Female	N	Male	Female	N
Family type						
Nuclear	1.5	1.4	284	0.8	1.3	86
Couple+ever married female relative	1.6	1.5	140	0.7	1.1	81
Other	1.5	0.8	21	0.4	1.1	18
Caste						
Vokkaliga	1.6	1.4	243	0.7	0.9	89
Sched. caste/tribe	1.9	1.3	90	0.8	1.4	59
others	1.4	1.4	112	0.4	1.3	37
Source of household income						
Agriculture	1.7	1.4	226	0.7	1.1	89
Labour	1.6	1.2	150	0.7	1.3	63
Others	1.4	1.5	69	0.5	1.1	33
Age of wife (years)						
Less than 24	1.3	1.0	112	0.5	0.6	45
25-29	1.6	1.1	118	0.6	1.1	72
30-34	1.6	1.6	112	0.7	1.4	39
35 and above	2 0	1.8	107	1.2	1.8	29
Education of wife						
Illiterate	1.6	1.4	305	0.0	1.2	118
Primary (1-4 years)	1.7	1.5	56	0.8	1.6	17
Middle (5-7 years)	1.5	1.3	65	0.8	0.7	29
High school and above	1.5	0.8	19	0.5	1.3	21
Occupation of wife						
Housewife only	1.5	1.3	124	0.7	1.0	87
Agriculture	1.8	1.5	158	0.8	1.1	40
Labour	1.5	1.2	145	0.6	1.4	36
Others	1.4	1.3	18	0.7	1.5	22
Total	1.6	1.4	445	0.7	1.2	185

in most subgroups. Although, in general, there is a cultural preference for sons, it was observed to be equally strong among all socioeconomic groups as indicated by household and individual characteristics. Therefore, many non-acceptors may become acceptors in due course after attaining the desired number of sons. To that extent, family planning acceptance is expected to rise very slowly and fertility will be influenced by son preference.

Again, as mentioned earlier, the high rate of acceptance among older women (35 and above), even those with higher education, points to a strong preference for sons, though occupation outside the home and a nuclear family setting apparently favour small families (Table 1).

Maternal and child health

To minimise recall error, we restricted data collection to the last pregnancy for studying natal health and to the youngest child below six years of age under the immunisation coverage programme. Table 3 gives a percentage distribution of the women in terms of natal care received during the last pregnancy indicated by an examination by a health professional, immunisation against tetanus, and deliveries conducted in a health institution by household and individual characteristics for acceptors and non-acceptors. In addition, information has been provided about the help received by women from their natal home at the time of delivery. This is a variable which has never been considered seriously in research studies.

At an aggregate level, about 64 per cent of the acceptors reported to have been examined by health professionals, a similar percentage had been immunised against tetanus, though only a tenth of the total deliveries had taken place in a health institution during the last pregnancy. The corresponding figures for non-acceptors were 80, 81 and 18 per cent. Thus, in general, non-acceptors had received relatively more antenatal attention from the health personnel. The non-acceptors being young, institutional deliveries were higher among them than among acceptors. Thus, the exposure to modern health facilities being higher among non-acceptors, they are likely to accept family planning once they achieve the desired number of sons. Again, although, domiciliary deliveries were very high in the sample as a whole, a large percentage of the women, both acceptors and non-acceptors, had been examined by health professionals and immunised against tetanus.

It is interesting to note that about 70 per cent of acceptors and 77 per cent of the non-acceptors had sought help from their natal home at the time of delivery. Seeking help from the woman's natal family is high in all socioeconomic groups as indicated by the differentials. Therefore, within the narrow circle of the family, the role played by the woman's natal family is relatively more important than that of her husband's family during the course of her fertility performance, in addition to the role played by health personnel in a wider context.

Table 4 presents a percentage distribution of the child health component for acceptors and for non-acceptors. As the findings show, child immunisation coverage was very high: about 91.8 per cent for BCG, 84.5 per cent for polio and DPT, and 82.3 per cent for measles among acceptors; and corresponding figures of 93.6, 83.0 and 82.4 per cent for children of non-acceptors. In the presence of high rates of coverage, the differentials by household and individual characteristics were not large. However, the percentage of children immunised was observed to be negatively associated with the age of the woman and positively associated with her level of education.

Differentials in maternal and child health services are not wide to point to inadequacies in coverage. However, scheduled castes and tribes should be given more attention through home visits as often as possible by health personnel at the periphery. In spite of this, health personnel working in the district should be complemented for achieving such a high MCH coverage. However, the district is atypical in many respects as described earlier. While, socioeconomic development is lower than or similar to that of the state as a whole, the commercialisation of agriculture leading to well developed transport and communication facilities, and a highly homogenous population in a physically compact area, are factors that might have helped the health personnel to function efficiently, and the community to enjoy easy access to their services.

TABLE 3

Percent distribution of acceptors and non-acceptors receiving antenatal services during the last pregnancy by household and individual characteristics

ousehold & dividual aracteristics	Acceptors					Non-acceptors				
	Examined by health personnel	TT immun-isation received	Hospital deliveries	Help from natal family	N	Examined by health personnel	TT immun-sation received	Hospital deliveries	Help from natal family	N
mily type										
uclear	59.9	60.6	11.9	73.6	284	73.3	75.6	12.4	75.6	86
ouple+ever married female relative	66.4	70.0	6.4	60.0	140	85.2	85.2	22.2	80.2	81
ther	90.5	90.5	14.3	90.5	21	83.3	83.3	27.8	72.2	18
aste										
okkaliga	67.9	67.9	9.5	76.1	243	83.1	86.5	24.7	88.7	89
ched. caste/tribe	60.0	58.9	6.7	63.3	90	71.2	69.5	10.2	61.0	59
ther	58.9	57.1	15.2	62.5	112	83.8	83.8	16.2	73.0	37
urce of household income										
griculture	68.6	68.1	10.2	73.9	226	80.0	82.0	22.5	80.9	89
abour	56.0	55.3	7.3	64.7	150	80.0	80.0	6.3	73.0	63
ther	66.7	65.2	17.4	69.6	69	75.8	75.8	30.3	75.8	33
ge of wife (years)										
ess than 24	89.3	87.5	12.5	79.5	112	88.9	88.9	22.2	88.9	45
5-29	75.4	74.6	10.2	74.6	118	91.7	91.7	16.7	83.3	72
0-34	47.3	46.4	8.9	64.3	112	71.8	76.9	23.1	76.9	39
5 and above	41.8	40.8	10.7	61.2	103	44.8	44.8	10.0	44.8	29
ucation of wife										
lliterate	59.0	58.4	8.5	67.5	305	76.2	77.1	11.8	76.3	118
rimary (1-4 years)	60.7	60.7	10.7	73.2	56	64.7	70.6	23.5	64.7	17
iddle (5-7 years)	83.1	81.5	13.8	76.9	65	89.6	89.6	27.6	86.2	29
igh school & above	89.5	89.5	26.3	78.9	19	95.2	95.2	38.1	80.9	21
ccupation of wife										
ousewife only	76.6	74.2	11.3	67.7	124	88.3	88.5	20.7	79.3	87
griculture	63.9	63.3	8.9	72.8	158	67.5	70.0	27.5	85.0	40
abour	54.5	55.2	-	69.0	145	75.0	75.0	8.3	72.2	36
ther	55.6	55.6	15.1	72.2	18	77.3	77.3	9.1	63.3	22
tal	64.0	63.4	10 3	70.1	445	79.5	80.5	18.4	77.2	185

TABLE 4
Percent distribution of acceptors and non-acceptors whose last child (0-6 years) received immunisation services by household and individual characteristics

Household & individual characteristics	Children of acceptors				Children of non-acceptors			
	BCG	DPT/ Polio	Measles	N	BCG	DPT/ Polio	Measles	N
Family type								
Nuclear	90.4	80.1	75.9	129	94.1	88.1	82.4	68
Couple+ever married female relative	92.7	89.0	90.2	82	94.4	88.1	85.7	72
Other	100.0	100.0	100.0	17	88.8	75.0	90.9	12
Caste								
Vokkaliga	94.7	90.2	88.1	133	97.4	85.5	89.2	77
Sched.caste/tribe	86.5	69.2	63.4	52	85.7	78.3	73.2	49
Other	90.0	85.2	83.9	60	88.2	76.5	69.0	34
Source of income								
Agriculture	94.8	90.6	89.4	166	96.0	83.5	84.1	75
Labour	88.2	76.1	73.4	93	92.3	84.3	80.0	52
Other	91.7	86.1	81.3	36	93.3	79.3	79.2	30
Age of wife (years)								
Less than 24	98.0	91.1	92.7	102	90.9	75.6	74.3	44
25-29	96.3	87.2	85.5	81	95.6	86.8	91.3	68
30-34	76.6	73.9	67.4	47	93.9	81.3	79.3	33
35 and above	73.3	66.7	50.0	15	91.7	91.7	63.6	12
Education of wife								
Illiterate	90.4	81.1	78.9	166	92.6	84.0	76.8	95
Primary (1-4 yrs)	84.6	85.2	73.1	26	100.0	92.8	100.0	14
Middle (5-7 yrs)	100.0	97.4	100.0	38	88.8	69.2	77.3	27
High school & above	100.0	86.7	90.0	15	100.0	89.5	100.0	21
Occupation of wife								
Housewife only	96.2	92.3	90.3	79	93.4	78.4	80.0	76
Agriculture	93.3	88.0	88.2	75	100.0	93.5	96.3	32
Labour	87.1	74.4	72.2	85	93.3	83.3	73.3	30
Other	83.3	83.3	66.7	6	84.2	77.8	73.3	19
Total	91.8	84.5	82.3	245	93.6	83.0	82.4	157

Conclusion

Even though, socioeconomic development is not very favourable, Mandya district has been able to achieve high and sustained progress in family planning, largely due to the participation of the community as whole in the programme. Otherwise, the differentials in the acceptance of family planning methods would have been larger than indicated by the study.

The differentials in maternal and child health services received by pregnant women and young children are not wide. In addition, coverage is high and services are easily accessible because of the inherent advantages possessed by the district. The maternal and child health programme may not have induced differentials in the acceptance of family planning. However, the minor variations in the acceptance of family planning in different socioeco-

nomic groups are due to the cultural preference for sons which is very strong in the community as a whole. There is a need to design a different communication strategy to combat this cultural bias and to achieve a far higher acceptance of family planning.

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Effect of seasonality on waiting time to conception: An Indian experience

Mr. Dilip C. Nath

Introduction

The seasonality of births is a complex phenomenon. A large number of environmental and climatic factors such as temperature, humidity, rainfall and light intensity may affect the risk of conception. Competing hypotheses to explain seasonal conceptions are that there exists a seasonal pattern in the fertilising capacity of the male sperm, or in the ovulatory function in the female. There are decreases in sperm motility and viability when the surrounding temperature is either very high or very low[1,2]. According to Takashi[3], there is an optimal temperature for human conceptions. The annual agricultural cycles and hence the availability of food is closely tied to temperature and rainfall patterns.

In some studies[4] rainfall has been observed to be related to monthly conceptions, while Frisch[4] reports nutritional intake as influencing fecundity though his study is not based on direct information on women's nutritional intake. An alternative is to use indicators of the standard of living as surrogates for the nutritional status of individuals. Further, the family's economic condition, which directly affects the nutritional status of the mother, is also crucial in explaining the risk of conception.

It is interesting to note that the first report on seasonal fluctuations concerning human births in India was published by Hill[6] as early as 1888. Since then, only a few Indian studies have been reported[7-9] on this subject, none of which has employed any sophisticated statistical technique to analyse the seasonality of births. A number of studies[10-21] conducted in other parts of the world, however, have examined the effects of seasonality on human births. Overall, these studies suggest that the pattern of seasonality of births in human populations varies considerably worldwide, within countries and over time as well.

This paper looks at the seasonal variations in the risk of conception in a traditional Indian society, using both single decrement life table and multivariate hazards regression techniques to analyse the data. Most of the earlier studies cited above are based on the number of births.

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Data and its characteristics

Data for the research presented in this paper comes from a retrospective survey entitled, 'A study on effects of socio-economic factors on fertility among a scheduled caste population in the rural areas of Karimganj District, Assam'. The survey was undertaken during 1988-89 under the auspices of the University Grants Commission, New Delhi.

The survey sought to obtain reliable data relating to fertility, to study the socio-economic and behavioural factors affecting fertility, and to estimate the bio-cultural parameters of human reproduction in traditional societies. In addition to other information, data were collected on the total number of children ever born, the timing of births, post-partum amenorrhoea and so on for all births occurring within seven years of the reference date of the survey (15 June, 1988), for each married, eligible female in the household. A couple was defined as *eligible* for the study if both the partners were alive on the reference date of the survey and the age of the female spouse was less than 50 years.

Life history events were dated to the year and month through the use of a calendar of local events such as major ceremonies like *annaprasan* (introduction of rice as solid food to the infant for the first time); important festivals; natural events such as a severe draught or eclipse; or a significant political incident.

The survey was confined to the scheduled caste population known to be socially backward and economically deprived. Karimganj district of Southern Assam is predominantly a Bengali speaking area, where a large number of villages are identified as scheduled caste villages*. From the list of scheduled caste villages of the district, a sample of 39 villages was selected by simple random sampling. All the scheduled caste households in these villages were enumerated; the survey comprised 1,805 scheduled caste households from the selected villages.

Only those eligible couples, numbering 1,378, who were normal residents of the village, and who did not practice any method of family planning to space and limit births were considered. Educational attainment among the scheduled caste population is very low, and most are still engaged in traditional occupations such as agriculture, fishing, cane work, pot-making and so on. In the present sample too, only a small number were employed in government or non-traditional, private sector jobs.

The impact of seasonality on the waiting time to conception, that is the period between resumption of menstruation and the time of conception, was studied. In addition, another important co-variate, the level of income measured in terms of the monthly per capita income, was also considered. The monthly per capita income of the family may be considered as an indicator of both the social status as well as the health status of the mother and children. The mothers were categorised according to the monthly per capita income (PCI) of the household into 'low' (below Rs.75) and 'high' (Rs.75 and above) PCI groups. Data related to meteorological information were used from two sources namely, Statistical Abstracts, Assam, and the Akbarpur Agricultural Research Centre, Karimganj, Assam (unpublished data).

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* A village is considered to be a scheduled caste village by the Directorate of Economics and Statistics, Assam, if at least 10 per cent of its population belongs to the scheduled castes.

Methodology

Only closed birth intervals irrespective of the birth order, except the first birth, that had occurred within seven years of the reference date of the survey were considered for analysis. The time of the first birth in Indian traditional society is affected by several socio-cultural factors[22,23]. Obviously, all women who had had at least two births were included in the analysis. The waiting time to conception was obtained by subtracting the duration of postpartum amenorrhoea and length of gestation, which was taken as nine months, from the birth interval.

Because of the dependence of the waiting time on the covariates studied, the use of conventional single decrement life tables[24] while revealing, is not sufficient for the analysis. Therefore, in order to investigate the partial effects of each variable on the waiting time, multivariate regression analysis was used. The use of the proportional hazards model of Cox[25] permits more detailed and penetrating findings to be extracted from retrospective and longitudinal data. Cox's model combines the merits of both life table and regression techniques. The hazard function or instantaneous risk function at time 't' is given by

$$h(t;z) = h(t)\exp(\beta z)$$

where, $h(t;z)$ represents the instantaneous rate of having a conception at time 't', given a prior live birth conception to a female with a vector of covariates. Z, $h(t)$ is an arbitrary non-negative unspecified baseline hazard function not dependent on the covariate and β is a vector of unknown regression coefficients to be estimated. The hazard function allows an estimation of the relative risks of the other groups in relation to specific baseline groups by the exponent of the regression coefficient $\exp(\beta)$.

The proportionality assumption of Cox's model was evaluated by testing for the significance of interactions of the duration variable with each of the covariates (that is, tests for interactions, including non-proportionality, were conducted). None of the interactions among covariates, including those with the time of conception, were statistically significant. Hence, it was concluded that the linear model holds with its proportionality assumption, and further analyses were conducted.

Results and Discussion

The pattern of temperature, rainfall, humidity and sunshine of the district of Karimganj as shown in Table 1 indicate a minimum temperature of 20°-24°C from April to October with a maximum temperature of 30°-32°C, and very high rainfall.

Normally, a dry season occurs in this region from late October to the middle of March, and humidity is relatively high. People here are relatively poor and most of these villages had no electricity. As such then, almost all the houses had no temperature controlling facility.

Table 2 gives a distribution of the women who conceived within 3, 12, 24, and 48 months following resumption of menstruation according to the month of conception, as also the estimated median waiting time to conception.

The overall waiting time as seen from Table 2, was 14.6 months, and the shortest and longest waiting times were in the months of April and December respectively. About 97 per cent of the women, and almost all who conceived in April, did so within 48 months of resumption of menstruation. The waiting time for women belonging to the high income group was 1.5 months shorter than that

TABLE 1
Monthly average meteorological data in and around Karimganj, Assam

Month	Temperature (°C) Max.	Temperature (°C) Min.	Rainfall (in mm)	Humidity (%)	Hours of bright sunshine
January	25.7	12.0	15.0	73.0	6.6
February	26.9	15.0	49.2	69.0	6.0
March	29.9	18.0	197.2	68.0	5.9
April	31.3	20.3	244.2	74.0	7.2
May	31.3	22.2	665.4	77.0	5.7
June	29.4	23.2	814.0	82.0	5.1
July	30.8	23.9	625.4	85.0	2.4
August	31.1	24.0	631.0	82.0	4.6
September	32.2	23.7	504.4	83.0	5.3
October	31.3	20.5	388.6	79.0	6.5
November	28.8	18.3	16.0	75.0	7.7
December	25.4	12.6	10.0	76.0	6.6

Source: (a) Statistical Abstract, Assam; (b) Akbarpur Agricultural Research Centre, Karimganj, Assam

TABLE 2
Distribution of women by month of conception and median duration of waiting time to conception

	Median duration of waiting time to conception	Percent women who conceived before				
		3 mths.	12 mths.	24 mths.	48 mths.	
Month						
January	13.2	5.6	47.6	75.0	96.4	84
February	15.6	11.8	41.1	70.6	98.8	85
March	14.5	21.5	40.5	74.7	96.2	79
April	12.6	12.9	47.2	75.0	99.1	108
May	15.6	8.5	38.5	68.5	97.7	130
June	12.7	7.5	47.5	79.1	98.1	158
July	14.4	11.4	39.6	75.1	97.3	149
August	15.0	9.6	38.3	75.3	96.6	146
September	14.5	16.0	42.7	67.3	97.3	150
October	16.0	11.2	38.3	74.8	98.1	107
November	15.7	9.4	43.1	84.2	96.8	95
December	17.1	11.5	41.4	72.4	96.6	87
Level of income						
Low	15.4	11.8	40.1	72.1	96.5	723
High	13.9	10.7	44.3	76.6	98.3	655
Overall	14.6	11.2	42.1	74.2	97.4	1378

for those belonging to the low level income group.

The findings of the multivariate hazards regression analysis are presented in Table 3. Model II expands by introducing income into the model. It was observed that the introduction of income as a control variable reduced the effect of those months for which the values were statistically significant, though the pattern of the association remained unaltered. The relative risk of conception during any month of a year - from January to March and May to December - was 4 to 24 per cent lower as compared to that during the month of April (model I). Further, women belonging to the low income group ran a lower risk of conception as compared to women in the high income group.

It has long been acknowledged that seasonal patterns of birth may be due to seasonal differences in climate at the time of conception. Temperature is more likely to affect the risk of conception through changes in sexual activity. A large segment of the rural population in India observes socio-culturally accepted norms of cohabitation. The wife and husband usually sleep together only at night and intercourse is practised late at night when the temperature is usually at its minimum. The minimum temperature during April to October lies between 20°C to 24°C, which is probably the optimum temperature for sexual activity (the comfort zone). That about 70 per cent of the women conceived during these seven months provides bio-medical evidence that humidity and temperature affect fertility.

Declines in female nutritional status are also known to reduce ovarian function. A higher per capita income suggests a better life and regular intake of nutritious food, which in turn, improve the health of the mother and accelerate the return of menstruation thereby making the woman biologically more susceptible to conception. Our findings support this evidence after controlling for the effect of

TABLE 3
Estimated regression coefficients from Cox's proportional hazards model

Covariates	β	Model I	S.E.	β	Model II	S.E.
		Exp(β)		Exp(β)		
Month						
January	- 0.1608	0.851	0.1440	- 0.1494	0.861	0.1441
February	- 0.2493**	0.779	0.1435	- 0.2332*	0.792	0.1437
March	- 0.1802	0.835	0.1502	- 0.1819	0.834	0.1502
May	- 0.3073+	0.735	0.1289	- 0.2841+	0.753	0.1292
June	- 0.0465	0.955	0.1230	- 0.0313	0.969	0.1231
July	- 0.1826*	0.833	0.1246	- 0.1844*	0.832	0.1246
August	- 0.2350**	0.791	0.1255	- 0.2154**	0.806	0.1258
September	- 0.2304**	0.794	0.1244	- 0.2186**	0.804	0.1245
October	- 0.1718	0.842	0.1346	- 0.1761	0.838	0.1347
November	- 0.0612	0.941	0.1391	- 0.0447	0.956	0.1393
December	- 0.2179*	0.804	0.1425	- 0.2067*	0.813	0.1425
Level of income						
Low				- 0.1332+	0.875	0.0647

Statistical significance: * = $p < 0.05$; ** = $p < 0.01$; + $p < 0.001$
Omitted categories: Month of April; high income group. (β) Regression coefficient, S.E. = Standard error

seasonality. A woman belonging to the low income group was 14 per cent less likely to bear a child as compared to one belonging to the high income group.

The higher risk of conception during April in our sample could be because the weather in April, is very pleasant and could be presumed to influence coital frequency. Secondly, April falls in the post-harvesting season when food is plentiful and can increase the woman's nutritional status enhancing ovarian function. Information regarding seasonal variations in the risk of conception, for example during April as indicated by this study, may be relevant to the design of family planning services in this part of the country. Couples should be motivated to practice contraception during this peak month when the woman is more susceptible to conception. Further, small area studies such as the present one, may be conducted in other parts of the country in order to implement meaningful family planning programmes.

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The possibility of India's population crossing that of China

Dr. P.N. Kapoor*

The UNFPA report, "The State of World Population, 1993" gives population estimates for 1992 and 2025 for China and India, among other countries. According to the report, China would have an estimated population of 1188 million in 1992, at an annual growth rate of 1.4 per cent (during 1990-95). India, growing at a rate of 1.9 per cent, would touch 879.5 million. The estimated population of India is higher than the official estimate as UNFPA seems to have adjusted the 1991 census figures for possible under-enumeration. Further, the annual growth rate of 1.9 per cent is somewhat lower than the growth rate of 1.97 per cent (for 1991) given by the Sample Registration System.

This note briefly examines the possibility of India becoming the most populous country in the world. Currently, China ranks first followed by India in the second position.

China is now very close to the replacement level of fertility. The UNFPA report estimates the total fertility rate (or TFR which represents the average number of children a woman would bear during her reproductive span) of China as 2.2 for the period 1990-95. The corresponding figure for India is 3.9 (SRS for 1991) which indicates that India is still far from achieving this goal, and is likely to achieve a net reproduction rate of unity only some time during 2011-20. Thus, while it would take another 40-60 years before India's population stabilises on account of population momentum, China may attain zero population growth 30-50 years from now.

Assuming that the growth rate declines linearly, that is by an equal amount from year to year, and that the population grows exponentially till zero growth rate is achieved, and remains constant thereafter, population projections have been worked out under various assumptions to study the number of years it would take for the populations of China and India to stabilise.

Projections for China and India

Tables 1 and 2 present population projections under six assumptions regarding the number of years it would take after 1992 (N_1) for the populations of China and India to stabilise (N_2). As Table 1 indicates, the period by which China

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TABLE 1
Projected population of China
Population stabilises after N_2 years from 1992

Year	Interval from 1992 (t)	Projected population when N_2 is					
		30	40	$\boxed{50}$	$\boxed{60}$	70	80
2000	8	1307	1313	1315	1318	1319	1320
2015	23	1441	1488	1517	1537	1551	1560
2025	33	1451	1549	1612	1654	1686	1709
2030	38	1451	1560	1643	1701	1744	1776
2040	48	1451	1560	1674	1768	1839	1894
2050	58	1451	1560	1674	1795	1900	1983
2060	68	1451	1560	1674	1795	1925	2042
2070	78	1451	1560	1674	1795	1925	2065

$P_2 (t) = P2 (0) \exp \{r_2 t/2N_2 (2N_2 - t - 1)\}$
$P_2 (0) = 1188$ (Population of China in 1992)
$r_2 = 1.4$ (Rate of growth of population 1990-95)
t = Interval between the year of projection and 1992
N_2 = Years from 1992 after which population will stabilise

☐ = Most plausible projections

would attain a stable population varies from 30 years when the population would be 1451 million, to 80 years when it would reach 2065 million. It seems most plausible that China's population would stabilise after 50 to 60 years, that is around 2040 or 2050. Thus, the most likely scenario in the case of China would be that of a population stabilising at 1674-1759 million between 2040 and 2050.

As indicated in Table 2, a stable population for India would vary from 1540 million in 2050 when N_1 is 50 years to 2048 million in 2080 when N_1 is 90 years. Comparative projections when a stable population would be reached in 2040 (i.e after 50 years from now) or 2090 (i.e. after 100 years from now) are also shown, the most plausible being 1694 million in 2060 AD and 1862 million in 2070 AD.

When would India's population cross China's ?

A comparison of the projections for China and India given in Tables 1 and 2, shows that India's population will cross that of China between 2030 and 2060 depending upon when exactly they achieve zero growth rates. Figure 1 presents the most plausible population projections for India and China and indicates that this would occur between 2035 and 2055, that is, when China achieves a stable population between 2040-2050 (when N_2 = 50-60 years) and India does so between 2060-2070 (when N_1 = 70-80 years). India's population would then be anywhere between 1694 -1862 million.

TABLE 2
Projected population of India
Population stabilises after N_1 years from 1992

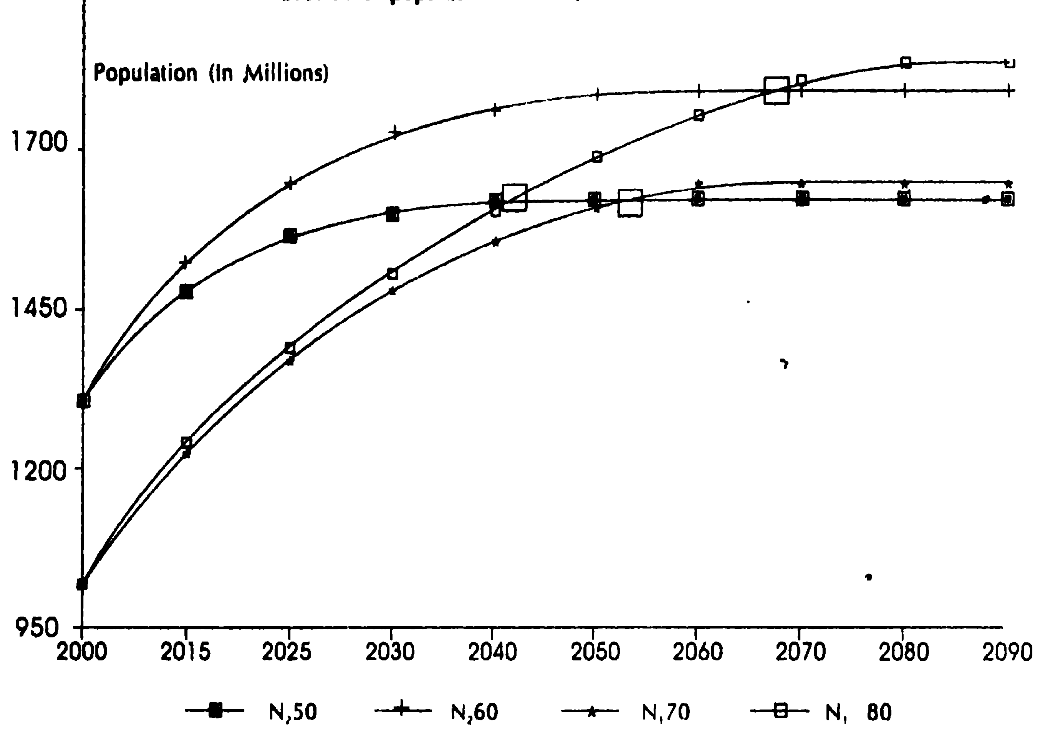
Year	Interval from 1992	Projected population when N_1 is						For China	
		50	60	$\boxed{70}$	$\boxed{80}$	90	100	Lowest Projection	Plausible Projection
								N_2=30	N_2=60
2000	8	1010	1012	1014	1015	1016	1017	1307	1318
2015	23	1226	1248	1263	1275	1284	1292	1441	1537
2025	33	1330	1378	1414	1441	1463	1480	1451	1654
2030	38	1366	1432	1481	1518	1548	1572	1451	1701
2040	48	1400	1509	1591	1656	1708	1751	1451	1768
2050	58	1400	1540	1664	1763	1845	1913	1451	1795
2060	68	1400	1540	1664	1834	1951	2050	1451	1795
2070	78	1400	1540	1664	1862	2020	2150	1451	1795
2080	88	1400	1540	1664	1862	2048	2225	1451	1795
2090	98	1400	1540	1664	1862	2048	2252	1451	1795

Note: Estimates for China are taken from Table 1 (Cols. 3 and 6).
$p_1 (t) = p1 (0) \exp \{r_1 t/2N_1 (2N_1-t-1)\}$
$p_1 (0)$ = Initial population = 879.5
r_1 = Initial growth rate = 1.9 (1990-95)
t = Interval between the year of projection and 1992
N_1 = Years after which population will stabilise in India
N_2 = Years after which population will stabilise in China
☐ = Most plausible projections

However, if India achieves a NRR of unity around 2000 AD (as per the present population policy), and zero population growth rate around 2040, India's population may not outnumber China's. Further, it may be noted that the size of a stable population rises by leaps and bounds with further delays in reaching a zero growth rate, as would be evident from the following projections:

Year when the population stabilises	2040	2050	2060	2070	2080	2090
Stable population (in millions)	1400	1540	1694	1862	2040	2252

FIGURE 1
Growth of population in India and China 2000-2090 A.D.



N_1 Number of years after 1992 when India's population stabilises.
N_2 Number of years after 1992 when China's population stabilises.
□ Year when India's population crosses that of China.

ANNEXURE

Methodology

Initial growth rate of population = r (per unit of population). It is assumed that the growth rate declines linearly to a level of zero 'N' years. This implies that rates of growth in successive years would be:

$$r - \frac{r}{N},\ r - \frac{2r}{N},\ r - \frac{3r}{N},\ \dots\ r - \frac{tr}{N},\ \dots\dots\ 0$$

It is assumed that the population will grow exponentially, i.e. the population after 't' years would be:

$$P(t) = P(0)\, e^{R} = P(0)\, \mathrm{Exp}\ (R)$$

$$\text{when } R = (r-r/N) + (r-2r/N) + \dots + (r-tr/N)$$

$$= r(1-1/N) + r(1-2/N) + \dots + r(1-t/N)$$

$$= tr - r/N\ (1+2+\dots\dots+t) = tr-r/N = tr-r/N\ (t+1)\ t/2$$

$$= \frac{rt\ (2N - t - 1)}{2N}$$

For using this simple model, we need to know only initial levels of population P(0) and rate of growth of population (r).

Regional variations in contraceptive choice in Andhra Pradesh

Dr. P. Satya Sekhar and Dr. C.P. Nagi Reddy

Introduction

Despite a 40 year-old family planning programme, India's 1991 Census has shown a population increase of 160 million during the 1981-91 decade; the increases registered during 1971-81 and 1961-71 were 137 and 109 million respectively. While the family welfare budget has increased from a mere Rs.6.5 million during the First Five Year Plan to a massive Rs.32,560 million during the Seventh Plan (1985-90), population growth has remained unabated. If this trend continues, the goal of reducing the net reproductive rate to unity by 2006-2011[1] appears remote.

The failure of the family planning programme can be attributed to four major drawbacks. First, population seems to be looked at as a disease to be cured by contraceptives and not as a socioeconomic problem to be solved through humane methods. Second, an excessive dependence on sterilisation (and in recent years, of female sterilisation) which, in practice, has led to the sterilisation of older couples (wife over 35 years of age) who already have four or more children[2]. Third, the sole concern for the achievement of quantitative targets, irrespective of the impact on the birth rate, and lastly, a lack of proper understanding of the regional variations in family planning performance including cultural factors.

Recent studies have focussed on the importance of widening the choice of contraceptive methods and in understanding the factors affecting contraceptive choice.[3-5] These studies have revealed that the demographic effect of excessive dependence on sterilisation is limited. In recent years therefore, the government programme has been emphasising spacing methods though sterilisation continues to be promoted. In this paper an attempt is made to enquire into the determinants of contraceptive-choice in Andhra Pradesh; the emphasis is on regional variations.

The objectives are to analyse (1) the usage and determinants of permanent contraceptive methods in different regions of Andhra Pradesh and in the state as a whole, and (2) the relationship between fertility and contraceptive method use.

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Sample and Methodology

The study is based on the data collected by the National Sample Survey Organisation (NSSO) during its 42nd round from July 1986 to June 1987. A sample of 5,142 households (3,327 rural and 1,815 urban) was drawn from Andhra Pradesh state, and information on the family planning practices of eligible couples during the 365 days preceding the survey was collected from husbands whose wives were between 15-49 years of age. In case the male partner was not available, the female partner was interviewed.*

Simple cross-tabulation analysis and logit analysis were used to analyse the determinants of family planning. In order to bring the regional variations in the acceptance of family planning methods, the NSSO had classified the districts into three regions namely Coastal Andhra, Rayalaseema and Telangana. Based on the agroclimatic and cultural practices in the districts, the Coastal Andhra region was further divided into two sub-regions - Srikakulam, Vizianagaram and Visakhapatnam districts dependent mainly on tank irrigation formed the North Coastal Andhra region and the remaining delta districts formed the Coastal Andhra region.**

Results and Discussion

The paper begins with a look at selected socioeconomic and demographic characteristics of the study population. The usage of family planning methods is examined next, followed by the relationship between fertility and contraceptive methods used, acceptance and practice of family planning methods, and the logit analysis of family planning acceptance.

Socioeconomic and demographic characteristics

About three-fourths (73 per cent) of the rural and two-fifths (40 per cent) of the urban households did not have any educated adult female; only a tenth (10 per cent) of the urban and one per cent of the rural households had at least one adult female who had attained more than 10 years of schooling.

That rural women started their reproductive life earlier than their urban counterparts was reflected by the finding that nearly half of rural women as against 38 per cent of the urban women reported their age at marriage as being under 16 years. Coastal Andhra had the highest proportion of early marriages (57 per cent) as compared to Telangana (43 per cent), Rayalaseema (37 per cent), and North Coastal Andhra (34 per cent). Thus, the developed regions had a higher proportion of earlier marriages of females.

Over half (52 per cent) of the rural and nearly two-fifths (37 per cent) of the urban households were self-employed; casual labour constituted 39 per cent and 15 per cent respectively. A fifth of the rural and almost a tenth of the urban households respectively belonged to the scheduled castes and tribes.

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* The sample data has been weighted to adjust for varying sampling probabilities and non-responses among the strata. The ORG (1990) administered the family planning survey in half of the total cases to husbands and in the other half; to wives.

** The North Coastal Andhra region comprised Srikakulam, Vizianagaram and Visakhapatnam districts; Coastal Andhra comprised East Godavari, West Godavari, Krishna, Guntur, Prakasam and Nellore districts; Rayalaseema comprised Kurnool, Anantapur, Cuddapah and Chittoor districts, and Telangana comprised Rangareddy, Hyderabad, Nizamabad, Medak, Mahabubnagar, Nalgonda, Warangal, Khammam, Karimnagar and Adilabad districts.

Within both the rural and the urban samples, the household composition did not exhibit any inter-regional variations in terms of the socioeconomic and demographic variables described above.

Contraceptive prevalence rate

A 1990 survey by the Operations Research Group (ORG) estimated the couple protection rate of Andhra Pradesh as 50.3 per cent. Of this, 46 per cent was attributed to sterilisation, 4.1 per cent to modern reversible methods, and 0.3 per cent to traditional methods. The NSSO estimate for 1989 places the rate at 33 per cent in rural and 43 per cent in urban areas of the state.

Analysing the state sample of the NSSO, region-wise, we observed that during 1986-87, about 40 per cent of rural and 45 per cent of urban couples had been protected. Table 1 provides the details.

It was interesting to observe that the use of spacing methods was quite high (higher than the state average) in some regions of the state such as rural Coastal Andhra and urban Telangana, and generally higher in rural areas. As far as contraceptive prevalence rates (CPR) were concerned, among rural areas, the Coastal Andhra region had the highest CPR (50.6 per cent) followed by the North Coastal Andhra, Telangana and Rayalaseema regions. In the urban blocks on the other hand, North Coastal Andhra recorded the highest CPR (64 per cent) followed by Coastal Andhra, Telangana and Rayalaseema. Thus, the CPR was the lowest in both rural and urban areas of Rayalaseema as compared to other regions.

Of the protected couples, 81 per cent of both rural and urban couples were found to have opted for sterilisation. The proportion of such couples varied considerably among the different regions of the state. Sterilisation, as a permanent method of family planning, was most prevalent in rural as well as urban areas of Rayalaseema as compared to the other regions, with 91 per cent of the protected couples opting for the method. On the other hand, it was interesting to note that more urban than rural couples opted for sterilisation in both the coastal regions. In Telangana too, 81 per cent of protected urban couples had resorted to sterilisation as compared to 65 per cent of protected rural couples. Further, the percentage of protected couples opting for sterilisation was lower than the state average (80 per cent) only in urban Telangana (65 per cent) and rural Coastal Andhra (78.5 per cent), while in all the other regions, it was higher.

Female sterilisation was the predominant method of choice between the male and female operations. At the state level, less than 25 per cent of both rural and urban sterilised couples had opted for vasectomy[6]. The regional data suggest that equal emphasis was given to both tubectomy and vasectomy in North Coastal Andhra whereas in the other regions, tubectomy was observed to predominate. However, in the Rayalaseema region, the percentage of sterilised couples opting for vasectomy was very low, about 10 per cent in both rural and urban areas.

Table 2 gives the CPRs in the rural and urban areas analysed by the age of the wife. The CPR was found to increase with age, reach a peak in the mid-thirties, and decline thereafter. As expected, the lowest rate was recorded in the age group of 15-19. The data on vasectomy indicated a better response in the rural areas (though the exact year/s when it was popular could not be pinpointed): the percentage

TABLE 1
Regionwise CPRs in Andhra Pradesh (percentage of eligible couples)

Region	Rural					Urban				
	Sterilisation			Spacing methods	CPR	Sterilisation			Spacing methods	CPR
	Tube-ctomy	Vase-ctomy	Total			Vase-ctomy	Tube-ctomy	Total		
North Coastal Andhra	17.6	18.8	36.9	7.5	44.4	29.5	26.0	55.8	8.1	63.9
Coastal Andhra	34.4	5.2	39.7	10.9	50.6	34.0	8.3	43.4	4.3	47.7
Rayalaseema	23.1	2.7	26.3	2.7	29.0	31.4	1.0	32.1	3.3	35.4
Telangana	19.9	8.8	29.1	7.0	36.1	23.5	6.3	27.4	14.8	42.2
Andhra Pradesh	24.8	7.5	32.9	7.5	40.4	29.2	8.3	37.0	8.5	45.5

* couples who adopted either vasectomy/tubectomy.

TABLE 2
Wife's age and CPRs in Andhra Pradesh (percentage of eligible couples)

Age of wife (years)	Rura						Urban					
	Vase-ctomy	Tube-ctomy	Steril-isation	MC	FC	CPR	Vase-ctomy	Tube-ctomy	Steril-isation	MC	FC	CPR
15-19	0.5	1.4	2.1	1.9	6.2	10.2	0.8	1.8	2.6	3.2	1.4	7.2
20-24	1.4	9.3	11.1	4.9	6.6	27.6	0.5	10.6	11.1	7.7	3.5	22.3
25-29	4.4	26.7	31.0	2.5	3.3	36.8	6.4	30.5	36.9	5.3	1.6	43.8
30-34	15.0	35.4	50.4	4.1	3.7	58.2	9.0	42.7	52.0	6.5	4.4	62.9
35-39	13.5	39.4	53.0	2.2	3.7	58.9	12.9	37.9	51.0	5.0	1.2	57.2
40-44	11.4	36.2	47.8	2.2	5.3	55.3	14.1	36.5	50.9	3.2	2.7	56.8
45+	9.0	20.6	30.1	-	-	30.1	20.5	27.4	47.9	2.6	-	50.5
All ages	7.5	24.8	32.9	3.0	4.5	40.4	8.3	29.2	37.0	5.4	3.1	45.5

MC = Male contraceptive i.e. condom.
FC = Female contraceptives such as IUD, Oral pill, diaphragm, jelly, foam tablets. Also includes MTP though it is not a F.P method.

of couples opting for the method rose from 0.5 among couples with wives aged 15-19 years to a peak of 15.0 among those with wives aged 30-34 years, declining steadily thereafter. Among urban couples, the rise was slower: 14.1 per cent and 20.5 per cent of couples with wives aged 40-44 and 45+ respectively accepted it.

Tubectomy was most accepted by wives aged 35-39 years in the rural and 30-34 years in urban areas. In the 45+ age group, it was much lower in rural (20.6 per cent) as compared to urban (27.4 per cent) areas. Among family planning methods other than sterilisation, the condom was more popular in urban areas whereas female methods were used more by rural couples.

Table 3 presents the CPRs by economic status and by the educational level of the wife. The findings indicate no significant difference in the CPRs among the different economic categories among both rural and urban couples, except in the case of salaried/wage earners. In other words, given the economic category of the household, there was only a marginal difference in the contraceptive use rates of rural and urban samples.

The effect of female education on the CPR was much more pronounced in rural than in urban areas. Even in urban areas, the rate improved with female education though the increase was not as marked as in the rural sample. For example, the CPR of the rural sample increased from 38.0 per cent for couples wherein the wives were illiterate to 57.5 per cent for couples wherein the female had received more than eight years of schooling. The increase was marginal in the case of urban couples: from 41.1 per cent to 45.4 per cent. This supports the argument that improvements in female education have a positive impact on family planning practice.

The salaried group which comprised 45 per cent of the urban sample, constituted about 57 per cent of sterilised urban couples, indicating a substantial bias towards sterilisation. In this context, a government scheme of offering one incre-

TABLE 3
Rural and urban sterilisation acceptors by advice received and by economic status and female education
(percentage of eligible couples)

Category	Rural			Urban		
	Sterilised	Received FP advice	CPR	Sterilised	Received FP advice	CPR
Economic status						
Self-employed	36.8	5.3	42.1	35.8	8.2	44.0
Salaried/Wage earner	34.1	15.0	49.1	41.1	9.6	50.7
Casual labour	27.4	9.2	36.6	31.1	6.3	37.4
Female education						
Illiterate	31.3	6.9	38.0	32.7	8.4	41.1
1-5 years' schooling	37.9	5.2	43.1	39.3	6.4	45.7
6-7 years' schooling	31.4	14.5	45.9	40.3	8.7	49.0
8-10 years' schooling	43.4	14.1	57.5	36.5	8.9	45.4
State	32.9	7.5	40.4	37.0	8.5	45.5

ment to couples opting for a small family as compared to other one-time incentives such as cash, or cash with an in-kind incentive, may have played a role in increasing sterilisation acceptance by the salaried group as compared to other economic groups.

Fertility and family planning

We have observed sterilisation to be the predominant method of family planning in both rural and urban areas of Andhra Pradesh. Many studies[3,5,6] have reported that the fertility of sterilisation acceptors is higher than that of non-acceptors or acceptors of other methods suggesting thereby that programme emphasis on sterilisation will not result in the desired programme impact. Table 4 looks at the average number of children ever born to married women in different age groups among acceptors and non-acceptors.

In the earlier section, we have shown an excessive dependence on female sterilisation with the average age of sterilised couples being over 30 years (Table 2). Table 4 indicates that couples in all groups who opted for sterilisation already had a 'sufficient' number of children. In contrast, the average number of children born to couples using spacing methods was much lower than that of sterilised couples. This was true both in rural and urban areas as also across different age groups. Further, one would expect some of these spacer couples to discontinue practice some time in the future; even so, it would not unreasonable to assume that their fertility, even after such method discontinuation, would not exceed that of the sample as a whole which, being around 2.5, is lower than that of sterilised couples. Thus, a large number of births can be averted if spacing methods are promoted actively rather than sterilisation.

Knowledge and practice of temporary methods

Table 5 provides a distribution of couples by knowledge and current practice of spacing methods.

The findings indicate that only 4.1 per cent of rural and 7.1 per cent of urban couples were practising birth spacing. Further, only 28 to 30 percent of the couples who had received family planning advice on birth spacing claimed to have received it from government agen-

TABLE 4

Average number of children born to acceptors and non-acceptors of family planning

Age of wife (years)	Acceptors of				Non-acceptors		Total	
	Sterilisation		Other methods		Rural	Urban	Rural	Urban
	Rural	Urban	Rural	Urban				
15-19	3.71	2.50	0.50	0.33	0.40	0.35	0.64	0.39
20-24	2.85	2.51	1.03	0.08	1.05	1.02	1.40	1.31
25-29	2.71	2.77	1.90	1.88	1.51	1.82	2.29	2.29
30-34	3.19	3.09	2.74	2.41	2.57	2.34	3.04	2.85
35-39	3.45	3.16	2.04	2.56	3.06	3.00	3.23	2.97
40-44	3.74	3.81	2.73	3.06	3.23	3.51	3.79	3.54
45+	3.71	3.91	3.70	3.48	3.84	3.71	3.71	3.78
All	3.25	3.19	1.87	1.89	1.94	1.90	2.56	2.54

TABLE 5
Regionwise family planning practice and advice received (percentage of eligible couples)

	Ever Practised		Current practice*		Advice received	
	Rural	Urban	Rural	Urban	Rural	Urban
North Coastal Andhra	15.7	4.5	8.0	7.7	56.1	35.0
Coastal Andhra	4.5	3.4	1.8	2.0	44.0	44 6
Rayalaseema	6.6	4.7	2.5	2 1	25.5	32.6
Telangana	4.9	10.7	5.6	13.9	33.8	52.7
Andhra Pradesh	6.4	6.3	4.1	7.1	38.3	44.9

* All couples practising a family planning method at the time of the survey are included in this category.

cies (not shown in the table). In terms of regional variations, the following observations were made:

1. The percentage of rural couples who had received family planning advice was very high in North Coastal Andhra and Coastal Andhra Regions; 56 per cent and 44 per cent respectively. These were much above the rural average of 38.3 per cent for the state. In contrast, only 25.5 per cent of the rural couples in Rayalaseema and 33.8 per cent in Telangana had received such advice.
2. In the urban sample, the highest proportion of couples in Telangana (52.7 per cent) had received family planning advice. This may be a reflection of the fact that about 43 per cent of the urban Telangana sample was from the Hyderabad district. The performance of all other regions was lower than the state average, with Rayalaseema registering the lowest percentage of 32.6 per cent.
3. It was interesting to note that North Coastal Andhra which has done exceedingly well in the dissemination of family planning in rural areas failed to do as well in urban areas. Further, in spite of a relatively high CPR (see Table 1) in Coastal Andhra, the percentage of couples currently practising family planning was very low. This phenomenon needs to be explored; the limitations of the present data did not permit such an analysis.

Table 6 which provides information on the use of spacing methods by the age of the wife, shows an inverted U-shape relationship between the wife's age and practice of birth spacing. The percentage of couples who ever practised family planning was the lowest when the wife was 15-19 years of age.

The findings also show that 38.3 per cent of the rural couples and 44.9 per cent of the urban couples had received family planning advice. However, there were no discernible differences in the percentage of couples who had received such advice in the different age groups. The highest number of both rural and urban couples in the 20-24 age group were practising birth spacing. This decreased with an increase in the wife's age.

We had observed a positive relationship, which was more pronounced in rural than urban couples, between female

TABLE 6
Family planning practice and advice received by age of wife (percentage of eligible couples)

Age of wife (years)	Ever practised		Currently practising		Advice received	
	Rural	Urban	Rural	Urban	Rural	Urban
15 - 19	0.9	1.4	1.4	6.0	47.4	47.9
20 - 24	5.1	2.7	6.2	9.5	44.5	45.0
25 - 29	7.3	5.6	4.8	7.4	38.2	41.1
30 - 34	6.8	7.5	4.5	8.3	34.8	49.5
35 - 39	9.3	9.1	2.9	7.1	34.8	45.0
40 - 44	5.5	0.9	2.8	3.4	32.0	42.9
45+	8.1	5.3	3.1	2.3	34.0	45.0
All	6.4	6.3	4.1	7.1	38.3	44.9

education and family planning use (Table 3). Table 6 indicates that while 6.9 per cent of rural illiterate women reported to have received family planning advice, and the figure increased to 14.1 per cent for women who had received eight to ten years of schooling, the corresponding figures for the urban sample were more or less similar: 8.4 per cent and 8.9 per cent respectively, indicating that family planning campaigning was more actively carried out in rural than in urban areas. It also implies that educated rural women were more receptive to family planning advice, or that rural family planning workers found it easier to contact and convince educated women than illiterate women as they are either not usually available, being away on farm work, or cannot be easily convinced. If the latter is true, much more can be done for the family planning programme by changing the perceptions of the family planning worker.

Logit analysis of family planning practice

Logit analysis has been used by various workers to study the relative contribution of socioeconomic factors to the use of family planning methods.[7,8] A review of the empirical studies suggests that the variables that are closely associated with family planning acceptance are a) education of the wife; b) caste-cum-religion to which the couple belongs; c) the number of children living; d) the number of sons living; e) the duration of marriage; and f) the economic characteristics of the household.

The logistic regressions for rural and urban areas are presented in Table 7. The acceptance (or non-acceptance) of sterilisation is modelled as a function of marital duration, presence of a literate female in the household, monthly per capita expenditure, and number of children. The two alternative specifications of the models differing only in terms of the inclusion or exclusion of the 'number of children' variable were considered (male and female children separately and together). Marital duration was represented by three dummy variables: less than five years, five to ten years, and the last, treated as a default variable, of more than ten years. The female literacy variable was classified into illiterate and with primary education, while that concerning the number of children was classified into male and female children separately, as well as the total number of children.

TABLE 7
Estimated models of contraceptive choice in Andhra Pradesh

Variable	Rural		Urban	
	Model I	Model II	Model I	Model II
Constant	- 1.053 (4.48)	- 1.051 (4.49)	- 1.151 (4.08)	- 1.131 (4.02)
Marital duration				
< 5 years	- 2.842 (9.22)	- 2.833 (9.21)	- 2.333 (7.99)	- 2.313 (7.89)
5-10 years	- 1.062 (8.65)	- 1.057 (8.65)	- 1 081 (7.11)	- 1.076 (7 09)
15+ years*				
No. of children				
Male	0.461 (8.44)	-	0 370 (5.45)	-
Female	0.179 (3.42)	-	0.140 (2.15)	-
Male + female	-	0 318 (8 21)	-	0 251 (5.28)
Female education				
Illiterate*				
Primary	- 0.401 (3.26)	- 0.386 (3.15)	- 0.672 (4.71)	- 0.442 (4 65)
Regional dummy variables				
North Coastal Andhra	- 0.060 (0.34)	- 0.051 (0.29)	- 1.133 (4.38)	- 1.119 (4.35)
Coastal Andhra	- 0.537 (3.55)	- 0.513 (3.41)	- 0 617 (3.19)	- 0.596 (3.05)
Telangana	- 0.614 (4.65)	- 0.578 (4.40)	- 0.320 (1 64)	- 0.328 (1.69)
Per capita expenditure	- 0.005 (4.05)	- 0.005 (4.06)	- 0.002 (1.72)	- 0.002 (1.73)
Likelihood function	-1130.14	-1130.12	-712.38	-709.25

* Omitted category
Figures in brackets are 't' values.

A short marital duration was observed to have a negative effect on sterilisation whereas a longer one (5–10 years) had a significant, positive effect. The education of the wife and the number of children had a significant positive impact on the acceptance of sterilisation. There was also a consistent and positive effect of the number of children on sterilisation acceptance: a one per cent increase in the number of living male children raised the probability of sterilisation from 0.5 to 0.6. However, a one per cent increase in the number of living female children raised the probability of sterilisation only from 0.2 to 0.3.

In order to capture the macro aspects, region was introduced as a dummy variable in the analysis. The results support the earlier findings. The regional dummy variables indicated a negative and significant coefficient for Telangana, indicating the presence of inter-regional variations in the acceptance (non-acceptance) of sterilisation. In the rural sample, the coefficients for Coastal Andhra and Telangana were negative and significant while they were positive and insignificant in the North Coastal Andhra region. This means that sterilisation acceptance is lower in the rural areas of Coastal Andhra and Telangana as compared to Rayalaseema. However, in the urban areas, the coefficients for North Coastal Andhra and Coastal Andhra were positive and significant, but positive and insignificant for the Telangana region.

Conclusion

The above analysis thus shows some

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* The dependent variable in such statistical analyses is a dummy variable representing whether a couple has adopted sterilisation or not. The use of the dichotomous dependent variable violates the assumptions of regression. However, the regression techniques are robust to violations if the dichotomy is close to fifty per cent each. Thus, we selected a randomly equal number of sample from the two groups.

clear patterns and a few contradictions. Thus, while it is easy to understand that the age at marriage is low in rural areas, it was surprising to find that the developed regions had a higher proportion of women who had been married before the age of 16 years.

The CPR in urban areas was generally higher than in rural areas except in Coastal Andhra where the former was slightly lower. Sterilisation was the most favoured method. Rayalaseema with the lowest CPR had the highest proportion of sterilisation acceptors among all rural as well as urban acceptors (91 per cent) in the region. Further, households with educated females reported to have received advice on family planning, this was more evident in rural than in urban areas. Assuming an active family planning campaign in rural areas, this may indicate that rural, educated women are more receptive to family planning advice as compared to illiterate women. However, this could be due to the perception of family planning workers that rural illiterate women cannot easily be reached (as a large number are away on farm work) and/or convinced of the need and urgency of the family planning. Appropriate data to test this hypothesis were not available but if this is true, the family planning programme can be made more effective by reorienting it to suit the needs and convenience of illiterate rural women. Thus, our results indicate that social and economic factors have a weaker impact as compared to demographic factors on family planning adoption.

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Impact of infant and child mortality on fertility and family size of white-collar workers

Dr. J.N. Srivastava

The relevance of studies on fertility response to infant and child mortality levels derives not only from their theoretical importance in the conceptualisation of demographic transition but also from the practical utility of such knowledge and the linkages between mortality decline, use of family planning and changes in fertility. This knowledge "offers the policy maker the opportunity to achieve greater gains in the health and economic well-being of the population within a given budget through the implementation of programmes designed to enhance and neutralise these linkages."[1]

Despite the importance of such data, only a few studies based on couple level data have been conducted for the Indian population. An earlier study by the author[2] conducted in Lucknow city reports a positive impact of infant and child mortality on both fertility and family size of couples varying widely with regard to education and income levels, while a later study (1991)[4] which sought to determine the impact of child mortality on desired family size and current use of family planning methods among a more homogenous and socioeconomically better-off group of white-collar workers in the same location observed a positive association between child mortality and family size desire, but a negative one between child mortality and current family planning use. Utilising the data from the latter study, the present paper seeks to investigate the impact of infant and child mortality on the fertility and family size of white-collar workers.

Two types of mechanisms have been identified linking mortality with the fertility of couples. The first is the non-volitional or 'physiological' mechanism operating in populations with natural fertility as well as in other settings with imperfect fertility control. It links length of birth intervals to infant mortality through its impact on breastfeeding duration (which has an ovulatory suppressant effect) as well as other postpartum practices restraining cohabitation during lactation. The second is a volitional mecha-

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nism, which operates in a context in which families formulate family size goals and they are willing or able to take action to limit family size.[4] The child survival hypothesis formulated in this context states that "experience with or fear of child mortality may lead parents to have additional births either to 'replace' the child or children who have actually died or as an 'insurance' against expected deaths.[4] In view of the nature of the sample, the present study was conducted within the framework of the child survival hypothesis.

Study design

The study is based on the data collected for a larger study of a fifty per cent sample of currently married white-collar workers working in the Uttar Pradesh Government Secretariat in Lucknow city, the state capital.[5] The bulk of the workers favoured the use of family limitation methods and had a fixed family size goal. Further, the practice of breastfeeding, although not investigated, may be expected to be quite short, particularly in view of the fact that the wives of the majority of the workers were educated upto high school level or above. In view of this, the 'physiological' effect of infant and child mortality would be negligible, and the impact detected could be attributed to their 'behavioural' response.

Based on the child survival hypothesis, it was hypothesised that the mean number of children born to couples with child mortality experience is larger in each age group of the wife as compared to couples without such experience. The weakness of such an analysis is that while attempting to find the influence of child mortality on fertility, it does not control the reverse influence of fertility on mortality. This reverse influence was sought to be controlled by classifying the couples by selected socioeconomic factors which have been found to influence their fertility. It was however, thought desirable, to supplement this with an analysis of subsequent fertility on child survivorship experiences to test more rigorously the 'child replacement' hypothesis. For this purpose, an analysis of the subsequent fertility of the couples in terms of their parity progression ratios and interbirth intervals was attempted. It was hypothesised therefore that couples with an early experience of child loss progress in larger proportions to higher birth orders than those without such experiences. It was further hypothesised that couples experiencing loss of children in infancy would have shorter birth intervals than those whose children survive, and that the 'insurance' motivation might lead to 'over-shooting' of fertility resulting in a larger number of surviving children among couples with child mortality experience.

Results and Discussion

Cumulative fertility

The analysis of the impact of child mortality on cumulative fertility is presented in Table 1.

The findings reveal that in each age group, the mean number of children ever born was the lowest among couples with no child mortality experience and increased with the number of such experiences. For example, in the 45+ age group, couples with no child mortality experience had only 3.99 children, while those who had lost one child had 5.10 children, and those who had suffered two or more child loss experiences had 7.06 children on average. For the sample as a whole, the fertility of couples with experience of one or more child deaths was 67.9 per cent higher than that of couples who had not

TABLE 1
Mean number of children ever born by age of wife and child loss experience

Wife's age (years)	No. of child loss experiences		
	0	1	2+
Below 25	1.54 (95)	2.33 (12)	-
25-29	2.07 (214)	2.94 (35)	3.75 (8)
30-34	2.67 (123)	3.89 (19)	5.50 (8)
35-39	3.38 (100)	4.75 (28)	6.33 (6)
40-44	3.49 (124)	4.90 (41)	6.17 (12)
45 & over	3.99 (177)	5 10 (49)	7.06 (34)
All ages	2.87 (833)	4.29 (184)	6.26 (68)

The figures in brackets denote the number of cases.

TABLE 2
Mean number of children born and child loss experience by age of wife and socioeconomic status

Socioeconomic status/age of wife	Number of child losses		
	0	1	2+
A. *Religion*			
Wife < 35 years:			
Hindu	2.11(396)	3.11(54)	4.86(14)
Muslim	2 20(34)	3.30(10)	4.00(2)
Wife 35-44 years:			
Hindu	3.40(196)	4.80(60)	6.13(16)
Muslim	4.05(19)	5.25(8)	7.00(2)
Wife 45 years & above:			
Hindu	3.82(154)	4.85(47)	7.03(33)
Muslim	5.50(20)	9.00(2)	8.00(1)
B. *Caste*			
Wife < 35 years:			
High caste Hindu	2.02(260)	3.24(29)	5.67(6)
Middle caste Hindu	2.16(75)	2.75(12)	3.75(4)
Low caste Hindu	2.48(61)	3.15(13)	4.75(4)
Wife 35-44 years:			
High caste Hindu	3.30(175)	4.49(41)	5.77(13)
Middle caste Hindu	4.33(9)	5.63(8)	7.00(1)
Low caste Hindu	3.93(14)	5.37(11)	8.00(2)
Wife 45 years & above:			
High caste Hindu	3.79(147)	4.84(44)	7.10(30)
Middle caste Hindu	3.83(6)	5.00(3)	10.00(1)
Low caste Hindu	8.00(1)	-	4.50(2)
C. *Education of wife*			
Wife < 35 years:			
Below primary	2.54(82)	2.82(22)	4.60(10)
Prim./Jr. high school	2.55(90)	3.21(19)	5.50(4)
High school/Inter	2.06(116)	3.06(16)	3.00(1)
Graduate & above	1.66(144)	2.50(8)	5.00(1)
Wife 35-44 years:			
Below primary	3.91(33)	5.55(20)	6.75(8)
Prim./Jr.high school	3.69(56)	5.00(25)	6.00(6)
High school/Inter	3.56(89)	4.43(14)	5.50(4)
Graduate & above	2.56(45)	3.60(10)	-
Wife 45 years & above:			
Below primary	4.55(27)	5.33(9)	7.69(13)
Prim./Jr. high school	5.21(46)	5.24(21)	6.09(11)
High school/Inter	3.25(72)	5.15(14)	7.30(10)
Graduate & above	3.33(31)	4.00(5)	-

(Contd.)

lost any children. The findings thus suggest a positive impact of child mortality on fertility as a result of child replacement and 'child insurance' motivations.

Cumulative fertility by socioeconomic status

As mentioned earlier, the influence of fertility on child mortality was analysed by controlling for selected, major socioeconomic characteristics such as religion and caste status, education of wife, and per capita family income which had been identified as factors creating fertility differentials among the sample white-collar workers in an earlier study.[6] In the following analysis, however, the number of age groups have been reduced to four in order to increase the number of observations in each cell.

As indicated in the table, in each socioeconomic category and age group, the number of children born increased with experience of child loss and the number of child loss experiences. The only exceptions were a few cases where the number

TABLE 2 *(Contd.)*

Socioeconomic status/age of wife	Number of child losses		
	0	1	2+
D. *Per capita income (Rs.)*			
Wife < 35 years:			
200 & below	2.54(188)	3.53(36)	5.09(12)
201-300	1.97(157)	2.86(21)	4.00(3)
301-400	1.54(48)	2.33(6)	3.00(1)
401 & more	1.43 (37)	1.33(3)	-
Wife 35-44 years:			
200 & below	4.80(59)	5.83(24)	6.78(9)
201-300	3.26(91)	5.04(24)	6.29(7)
301-400	3.00(45)	4.17(12)	-
401 & more	1.96(29)	2.56(9)	3.50(2)
Wife 45 years & above:			
200 & below	5.83(12)	6.67(6)	4.50(2)
201-300	4.89(47)	5.72(18)	8.14(14)
301-400	3.53(47)	5.25(8)	6.89(9)
401 & more	3.40(71)	3.82(17)	6.11(9)

The figures in brackets denote the number of cases.

of observations in the cell were too small. Again, the findings suggest a clear positive impact of child mortality on fertility attributable to child replacement and 'child insurance' motivations.

Subsequent fertility

As mentioned earlier, two measures of subsequent fertility, namely, parity progression ratio and interbirth interval were used. The analysis was also controlled for socioeconomic status of the couples. However, to increase the number of observations in the cell, closer socioeconomic categories were combined.

Parity progression ratios

Parity progression ratios were computed to study the rate at which couples with or without child loss at a particular birth order progressed to the next birth order. For this, the impact of mortality during the first two birth orders on progression ratios upto the sixth order were studied. Although, it would have been more appropriate to compute progression ratios of couples who had completed their reproductive life to get a larger number of observations, the progression ratios of 437 couples with the wife aged 40 years and above were computed. Since almost all of them had completed their families, their progression ratios were expected to closely approximate those obtained had they completed their reproductive lives. Since there were very few couples (eight) with the wife aged 40+ who had lost both their first two children, and this number was further reduced on socioeconomic classification, the ratios pertaining to these cases have to be interpreted with caution. The progression ratios of these 437 couples are presented in Table 3.

The analysis reveals a sharp reduction in the parity progression ratios of couples with no experience of child loss in first two birth orders. About three-fourths of the couples progressed to the third birth

TABLE 3
Parity progression ratios of women aged 40 years and over upto the sixth birth order

No. of child losses during the first two births	Parity progression ratios for birth order				
	I-II	II-III	III-IV	IV-V	V-VI
0 (345)	942	777	559	345	212
1 (84)	964	857	810	667	452
2 (8)	1000	1000	875	625	625

The figures in brackets denote the number of cases.

order, about 56 per cent to the fourth, and a third to the fifth birth. In comparison, the progression ratios were substantially higher even when there was one child loss experience with as many as two-thirds of the couples progressing to the fifth birth order and 43 per cent even to the sixth; in the case of loss of both the first two children, there was a high probability of the couples going upto the sixth order. The results once again confirm the operation of child replacement motivation.

Parity progression ratios by socioeconomic status

Table 4 presents the impact of child loss during the first two live births on parity progression ratios by the socioeconomic status of the couples.

The findings indicate that the parity progression ratios in each category were higher when the couples had experienced child than when they had not. The only exceptions were progression ratios from

TABLE 4

Parity progression ratios up to the sixth birth order by socioeconomic status

Number of dead	Parity progression ratios for birth children order 'n' to 'n+1'				
	I-II	-III	III-IV	IV-V	V-VI
A. *Religion*					
Hindu:					
0 (308)	945	776	545	321	179
1 (77)	974	857	805	649	429
2 (8)	1000	1000	875	625	625
Muslim:					
0 (28)	929	821	750	643	571
1 (7)	857	857	857	857	714
B. *Caste*					
(Hindu) High:					
0 (282)	940	762	521	301	156
1 (69)	971	841	783	638	420
2 (8)	1000	1000	875	625	625
Middle/Lower:					
0 (26)	1000	923	808	538	423
1 (8)	1000	1000	1000	750	500
C. *Education of wife*					
Upto Jr. high school:					
0 (145)	993	876	724	503	338
1 (63)	968	905	873	714	524
2 (4)	1000	1000	750	500	500
High school or above:					
0 (199)	905	704	437	226	116
1 (21)	952	714	619	524	238
2 (4)	1000	1000	1000	750	750
D. *Per capita income*					
Rs.300 and below:					
0 (157)	1000	924	745	478	306
1 (42)	1000	1000	1000	905	690
2 (6)	1000	1000	833	667	667
Rs.301 and above:					
0 (188)	894	654	404	234	133
1 (42)	929	714	619	429	214
2 (2)	1000	1000	1000	500	500

The figures in brackets denote the number of cases.

the first to the second birth among Muslim and lower education (wife's) groups possibly due to the physical inability of one couple in the former group and two couples in the latter to produce children after the death of the first child. The findings again provide evidence of child replacement motivation irrespective of caste, religion, income or wife's education.

Interbirth interval

Another measure of subsequent fertility is the interbirth interval, termed hereafter as birth interval, gives the average length of time between successive live births and shows the rapidity with which replacement of the dead child takes place. In Table 5, the birth interval between successive birth orders for couples who had lost the reference child during infancy and those whose reference child had survived are presented. Since fetal wastage between successive births are known to vitiate the analysis,[7] women who had had such experience were eliminated. Table 5 presents the results.

Table 5 indicates that the mean birth interval was consistently smaller at each birth order among couples who had experienced infant mortality than among those whose reference child had survived. This suggests that in order to replace the dead child, the couples bore the next child more quickly than did those who did not experience child loss.

The mean birth interval was observed to be nearly the same for all birth orders. This conforms with the finding of an earlier study with a different sample.[2] This is possibly due to the working of two contrary forces. For an individual woman in general, the birth interval tends to be longer for higher birth orders except when the woman has lost a child, in which case the subsequent birth interval may be shorter than the preceding one. However, when the birth intervals of a particular age group of women are analysed, they tend to be shorter for higher birth orders. In fact, the shorter interval between successive births among high parity women in this age group reflects their higher fertility partly due to child loss experiences. Therefore, when birth intervals are computed for a total sample of women, the results give nearly the same birth interval for all birth orders.

Birth interval by socioeconomic status

Due to the small number of child deaths, the analysis of subsequent birth

TABLE 5

Mean birth interval (years) between birth order (n) and (n+1) by death of child during infancy, and survival upto time of survey in cases without pregnancy wastage between births

Live birth order (n)	Child surviving upto survey		Child dying in infancy		Difference
	No of cases	Mean birth interval	No. of cases	Mean birth interval	
1	753	2.46	75	1.85	- 0.61
2	542	2 54	48	2.18	- 0.36
3	348	2.35	24	2.17	- 0.18
4	202	2.38	16	1.66	- 0.72
5	109	2.34	13	2.11	- 0.23
6	54	2.43	6	1.33	- 1.10

TABLE 6
Subsequent birth interval (years) after first birth by survival of the child during infancy without pregnancy wastage in between, by socioeconomic status

Live birth order (n)	Child surviving upto survey		Child dying in infancy		Difference
	No of cases	Mean birth interval	No of cases	Mean birth interval	
A. *Religion*					
Hindu	672	2.49	67	1.88	- 0.61
Muslim	72	2.04	8	1.62	- 0.42
B. *Caste (Hindu)*					
High	523	2.46	45	1.97	- 0.49
Middle/Low	149	2.58	22	1.69	- 0.89
C. *Education of wife*					
Below primary	160	2.54	27	1.65	- 0.89
Primary/Jr. high school	208	2.47	26	1.67	- 0.80
High school & above	383	2.42	22	2.30	- 0.12
D. *Per capita income*					
Rs. 200 & below	257	2.27	32	1.55	- 0.72
Rs. 201-300	278	2.45	23	1.61	- 0.84
Rs. 301 & above	218	2.69	20	2.60	- 0.09

intervals by socioeconomic status was confined to the interval between the first and second births. Table 6 presents this data.

In all the four socioeconomic categories – religion, caste, wife's educational level, and per capita family income - the mean birth interval among women who had experienced the death of an infant child was relatively shorter than that of women whose child had survived infancy. However, the impact of infant loss appeared to be higher at the lower as compared to the higher level within each socioeconomic category. For example, the difference between the two birth intervals (with and without infant loss) was far smaller among high caste Hindus as compared to that among middle or lower caste Hindus. Similarly, it was smaller when the wife had received high school education or the family's per capita income was Rs 300+ as compared to their respective, corresponding lower categories.

Family size

The hypothesis that child insurance motivation may lead to the phenonmenon of a 'fertility shoot up' among couples experiencing child loss thereby resulting in a larger number of surviving children in the family, was tested by analysing the impact of child mortality on family size. Table 7 presents the findings of this analysis.

Table 7 shows that couples wherein the wife was 30 years or more and who had experienced child loss had a consistently larger number of children than those who had had no such experience. Among younger couples, however, greater procreation did not appear to compensate for child loss experience due to the short exposure time. Further, larger family size was generally associated with higher child

TABLE 7
Mean number of surviving children by age of wife and child loss experience

Age of wife (years)	Child loss experiences		
	0	1	
Below 25	1.54 (95)	1.33 (12)	
25-29	2.07 (214)	1.94 (35)	1.63 (8)
30-34	2.67 (123)	2.89 (19)	3.38 (8)
35-39	3.38 (100)	3.75 (28)	4.17 (6)
40-44	3.49 (124)	3.90 (41)	3.67 (12)
45 & over	3.98 (177)	4.10 (49)	4.26 (34)
All ages	2.87 (833)	3.29 (184)	3.74 (68)

The figures in brackets denote the number of cases

loss. For example, at the end of the reproductive period i.e. when the wife was 45+ years, couples with no child loss experience had 3.98 surviving children as compared to 4.26 in the case of couples who had lost two or more children. Overall, as compared to couples with no experience of child loss, those with one or more such experiences had a 19 per cent larger family size in terms of surviving children, indicating evidence of the child insurance hypothesis and the 'fertility shoot up' associated with it.

Family size by socioeconomic status

As the positive impact of child mortality on family size appears among wives aged 30 years and more, Table 8 provides the findings relating to this by the selected socioeconomic indicators. The couples were distributed into two broad age groups namely, 30-39 years and 40 or more years to facilitate presentation as well as to increase the number of observations in each cell as far as possible.

TABLE 8
Mean number of surviving children by child loss, age of wife and socioeconomic status

Socioeconomic status/wife's age	Child loss experience	
		1 or more
A *Religion*		
Wife 30-39 years:		
Hindu	2.94(194)	3.55(54)
Muslim	3.52(23)	3.17(6)
Wife 40 years & over:		
Hindu	3.67(269)	3.97(123)
Muslim	5.33(24)	4.82(11)
All ages:		
Hindu	2.80(746)	3.42(223)
Muslim	3.59(73)	3.48(25)
B *Caste status*		
Wife 30-39 years:		
High caste Hindu	2.80(155)	3.56(39)
Middle/lower caste Hindu	3.49(41)	3.53(15)
Wife 40 years & over:		
High caste Hindu	3.61(254)	3.85(104)
Middle/lower caste Hindu	4.60(15)	4.63(19)
All ages		
High caste Hindu	2.85(582)	3.53(162)
Middle/lower caste Hindu	2.64(166)	3.15(61)
C. *Education of wife*		
Age 30-39 years:		
Below Primary	3.59(37)	4.07(13)
Primary & Junior high school	3.54(54)	3.71(24)
High school/Inter.	2.97(66)	2.99(17)
Graduate and above	2.20(65)	2.67(6)
Age 40 years & over:		
Below Primary	4.30(43)	4.46(43)
Primary & Junior high school	3.17(76)	4.02(49)
High school/Inter.	3.46(124)	3.88(33)
Graduate and above	2.91(56)	2.70(10)
All ages:		
Below Primary	3.23(142)	3.45(82)
Primary & Junior high school	3.51(192)	3.70(86)
High school/Inter.	2.80(277)	3.29(59)
Graduate and above	2.06(210)	2.34(24)

(Contd.)

TABLE 8 *(Contd.)*

Socioeconomic status/wife's age	Child loss experience	
	0	1 or more
D. *Per capita income*		
Wife 30-39 years:		
Rs. 200 or less	3.80(90)	4.12(34)
Rs. 201-300	2.68(82)	3.00(19)
Rs. 301-400	2.43(20)	2.00(7)
Rs. 401 & more	1.70(20)	2.00(1)
Wife 40 years & above		
Rs. 200 or less	5.51(31)	5.04(23)
Rs. 201-300	4.28(99)	4.62(50)
Rs. 301-400	3.28(78)	3.77(26)
Rs. 401 & more	3.02(92)	2.75(36)
All ages:		
Rs. 200 or less	3.17(258)	3.63(89)
Rs 201-300	2.83(295)	3.67(86)
Rs 301-400	2.62(139)	3.33(36)
Rs. 401 & more	2.54(137)	2.55(40)

The figures in brackets denote the number of cases.

The results show that, in general, and in each socioeconomic category with a few exceptions, the number of surviving children among couples with child mortality experiences was higher than among those without such experience. The exceptions were a few cells with very few observations, and in the highest per capita income group. In the former case, of the six Muslim couples who had experienced child loss, four (wife's age 30-34 years) had lost one child each and had compensated for the loss, and two (wife's age 35-39 years) had a marginally larger number of surviving children than couples without child loss experience. Table 7 shows that in both the age groups, the number of surviving children among Muslim couples was smaller when they had experienced child loss than when they had not. The small number of observations does not permit any inference to be drawn regarding the relationship between child loss and family size among Muslim couples.

As regards the latter exception, that is, in the highest per capita income group of Rs. 401 and more, the lack of a positive impact appears to be genuine. In the three five-year age groups included in the broader age group given here, the number of surviving children was smaller among couples with child mortality experience, while in one age group there was no observation in the mortality cell. Therefore, the larger number of surviving children in the mortality cell in the age group 30-39 as well as computation for all ages is spurious. It is interesting to note that a similar lack of a positive impact of child mortality on the number of children desired by couples with the highest per capita income level was observed earlier.[3]. The findings suggest that child insurance motivation was operative among the majority of couples with child loss experience leading to a larger family size.

Conclusion

In sum, the analysis of the impact of child mortality on fertility brings out that white-collar workers, in general, as well as at each socioeconomic level, faced with the experience of child loss, bore a larger number of children to replace their dead children, and to 'insure' the survival of an adequate number of children who would outlive them; this excess was associated with the number of child loss experiences.

The child replacement hypothesis when tested by using parity progression ratios and interbirth intervals as measures, revealed that parity progression ratios to higher birth orders were higher among couples with early experience of child loss than among those without such experiences. There was a high probability among couples who had lost both their first two children to proceed upto the sixth birth order. Likewise, the mean birth interval among couples whose reference child had died in infancy was consistently smaller at each birth order than that of couples whose reference child had survived. The corresponding analysis of intervals between the first and second births by socioeconomic indicators such as caste, wife's education, and per capita family imcome revealed a higher impact at the lower level or range of each socioeconomic indicator. Further, except at a per capita family income of Rs.300+, couples of all castes and at all levels of the wife's education and per capita income below Rs.300 who had had an experience of child loss, had more surviving children than those who had not lost any children.

The findings provide evidence for the operation of child insurance motivation and the appearance of the phenonmenon of 'fertility shoot up' among the majority of the couples. Bearing in mind the fact that the present sample consisted of a socioeconomically better-off section of the population with fixed family size goals and who practised family planning, it is likely that the positive impact of child mortality on family size would be relatively larger in the general population.

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Determinants of contraceptive choice in India

Dr. Ravi K. Verma and Mr. P.K. Baburajan

In the Indian context, there are two main reasons for the need to acquire a deeper understanding of the determinants of contraceptive method choice. First, there is a growing realisation that the number of women in their reproductive ages is likely to grow for some time to come, a feature unfavourable to fertility decline unless these couples space their next birth; a realisation that has promoted spacing methods as opposed to the earlier stress on sterilisation.[1] Second, Indian studies have, by and large, concentrated on the reasons for non-acceptance which, at best, suggest the determinants of choice indirectly.[2-7] However, recently, the field of contraceptive use dynamics has attracted the attention of researchers primarily due to the substantial gap that exists between contraceptive intentions and actual behaviour.[8]

The work of Bulatao and his colleagues[9] has further sharpened the focus on conceptual and methodological issues relating to contraceptive choice. Subsequently, in India, a number of studies were initiated by funding agencies namely the WHO Special Programme on Research Development and Research Training in Human Reproduction, the Ford Foundation, and the International Planned Parenthood Federation.[10] Also, the Family Planning Association of India devoted the September 1990 issue of its quarterly journal, *The Journal of Family Welfare* to the subject.

The results of some of these studies seem to clearly suggest varying reasons for choosing one method over another at different stages of acceptance.[5,6,10,11] While these studies have thrown adequate light on the reasons for method use, continuation or discontinuation, or method switching behaviour, they have concentrated either upon one method at a time or followed a cohort of users of a particular method to study the dynamics of method use.

The present study is a retrospective one and attempts to operationalise the theoretical framework suggested by Bulatao[9] to study contraceptive method choice. This study is also a departure from earlier attempts, particularly in the Indian context, in the sense that it utilises recent advances in the technique of analysing contraceptive method choice by considering various contraceptive methods simultaneously.[12] Thus, it aims at assessing the factors which influ-

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ence the choice of one contraceptive method over another in a population which is characterised by a wide choice of methods.

Theoretical considerations

The decision to choose an appropriate method involves a variety of factors related to contraceptive use. These have been broadly classified by Bulatao[9] into contraceptive goal, contraceptive competence, contraceptive evaluation, and contraceptive access.

Contraceptive Goal: has been defined as a specific fertility effect that a woman or a couple seeks to achieve through contraception to avoid all future births or to postpone the next birth. Thus, a woman who considers it imperative to avoid future births would experience greater pressure to make appropriate fertility decisions than one who wishes to avoid future births but would not feel so seriously inconvenienced by another child.[9] In the present study, contraceptive goal was assessed by using the following four variables - reason for not using the method; number of living children; desire for more children; and ideal family size.

Contraceptive Competence: that is, how effectively a method is used; this is determined by the amount of method-related information available to the individual, attitude towards family planning, strength of interspousal communication, and perceived capability to control fertility. Education and class differences have also been shown to be important in this regard.[4] The variables used in the present study to assess the competence of a couple regarding contraceptive use were: husband-wife communication; knowledge of family planning methods; perceived capability to control fertility; educational level; attitude towards family planning; and age at marriage of the wife.

Contraceptive evaluation: relates to judgments about the practical and moral implications of family planning methods covering all the relevant features of the method, particularly perceived fear of side effects.[2-5] In the present study, only the fear of side effects was considered to assess the couple's evaluative aspect of contraception.

Contraceptive access: is the availability and affordability of family planning methods. The affordability of a method is affected by the economic status of the couple and/or the presence or absence of government programmes within the reach of the individual. The economic status of an individual also determines his/her access to knowledge about contraceptives. The term 'access' therefore, has a wider meaning than mere physical availability of the service. Thus, here, the variables considered to assess the couple's access to contraception were their awareness of a family welfare centre in the locality, and monthly income.

Study Area and Sample

The data for the present study was collected as a part of a larger study on contraceptive use dynamics conducted in an industrial township located in Greater Bombay during May-August 1991. This public limited organisation had about 7,000 employees and maintained a township consisting of 5,962 households. The rationale for choosing this area for the study was that it provided a heterogenous sample of urban service class respondents with not only a high level of contraceptive practice but also having a wider choice of contraceptives.

In the study area, five different strata were identified according to occupational category. Based on a complete enumeration of eligible couples in the area from available office records, a list of eligible couples was prepared for each stratum. The total number of eligible women in the five strata was 4,571. Adopting the technique of stratified random sampling with proportional allocations for the strata, a 10 per cent sample of the total eligible women was drawn. A sampling interval was calculated for each stratum based on size, and its sample size was fixed. A number between one and the interval was randomly selected for a random start. Exactly 10 per cent of the total number of households with eligible women i.e. 457 could not be achieved either due to a locked household or because the woman was pregnant at the time of the interviewer's visit. As a result, 412 currently married women aged 15-44 years who were not pregnant at the time of the visit were interviewed using a structured and pretested questionnaire. The interviews were conducted by trained female investigators.

Results and Discussion

The majority of the respondents were young and in their peak childbearing years of 25-29; the average age was 29.7 years. The average age at marriage was found to be 19 years. The respondents had on an average 2.29 living children, and the use of family planning methods was found to be very high (84.2 per cent); the proportion of respondents using spacing methods constituted about 52 per cent of the total current users. About 87 per cent of the respondents were literate, 84 per cent were housewives and 78 per cent of them had a monthly income up to Rs. 2000.

Contraceptive Status

Family planning practice was found to be quite high, as indicated in Table 1. About 84 per cent of the respondents were ever users of family planning, of whom, about 90 per cent (311) were current users. Among the current users, about 22 per cent had accepted a modern temporary method- the IUD or oral pill; about 31 per cent were using conventional methods including condoms, and about 48 per cent had accepted a terminal method.

TABLE 1
Contraceptive status of the respondents

Category of respondents	Number
Ever-Never users	
Never used	65 (15.8)
Ever used	347 (84.2)
Current use status	
Never users	65 (15.8)
Current user*	311 (75.5)
Past user**	36 (08.7)
Current users by method	
Rhythm	35 (11.3)
Condom	60 (19.3)
Oral Pill	10 (3.2)
IUD	57 (18.3)
Sterilisation	149 (47.9)

* indicates that the analysis of contraceptive choice is confined to these 311 current users.

** indicates the use of a method in the past but currently not practising any method.

Determinants of Contraceptive Choice

Factor analysis

In order to assess the exact role of the four contraceptive choice related dimensions i.e. goal, competence, evaluation and access, in determining the choice of a particular method over the others, a composite index was generated separately for each dimension using the factor loading extracted from each dimension. The use of factor analysis is justified on two grounds: first, it is an objective and data dependent method for identifying indicators, and second, in the presence of overlapping variables in the different dimensions it was thought appropriate to extract the most basic factor.

Factor analysis was employed for the first three dimensions while the fourth one, that of contraceptive evaluation, was represented by a single variable. Varimax criteria were used to extract the factor loadings. Factor loading of each variable under the three contraceptive dimensions is presented in Table 2.

The findings indicate that two factors were generated for contraceptive goal and one each for contraceptive competence and contraceptive access. The two factors of the goal dimen-

TABLE 2
Results of factor analysis for each of the three contraceptive dimensions

Contraceptive goal: two factors extracted			
Variables		Factor I	Factor II
Reason for use		0.95531	- 0.12551
No. of living children		- 0.44524	0.74874
Future child desire		0.96421	- 0.08809
Ideal family size		0.06311	0.92826
	Eigen value	*% of Var.*	*Cum. %*
Factor I	2.3105	57.8	57.8
Factor II	1.1797	29.5	87.3

Variable	*Factor I*
A. Contraceptive competence: One factor extracted	
Husband-wife communication	0.72903
F.P. knowledge	0.75261
Perception of self-control	0.57188
Education	0.81705
F.P. attitude	0.61311
Age at marriage of wife	0.68968
Factor I:	
Eigen value - 2.9440; % of variance - 49.1	
B. Contraceptive access: One factor extracted	
Awareness of F.W. Centre	0.75444
Monthly income	0.75444
Factor I:	
Eigen value - 1.1383; % of variance - 56.9	

sion could explain about 87 per cent of the variation among the four variables considered under this dimension. Contraceptive competence and access were responsible for 49 and 57 per cent of the variation respectively. Contraceptive goal, which explained the highest variance (57.8 per cent), and the two factors, one each generated for competence and access, were considered for further analysis. The value of each factor for every respondent was computed using factor loading.

On the basis of the distribution of the values of the factor variables, each respondent was assigned a code of 1 if her score fell below the mean, and a code of 2 if her score was above the mean. Since contraceptive evaluation was represented by a single variable, the actual value of this variable was considered for classifying the respondents.

Thus, a total of four variables, one each representing goal, competence, evaluation and access were considered in the multinomial logit analysis.

Multinomial Logit Analysis

Multinomial logit analysis is the most appropriate technique in a situation where the dependent variable is categorical and has more than two outcomes.[12] The model permits a study of the effect of a unit change in the independent variable on the dependent variable considering the simultaneous effects of several variables. The dependent variable in the analysis of contraceptive method choice had five outcomes; namely rhythm, condom, oral pill, IUD, and sterilisation.

Table 3 provides the multinomial logit regression coefficients and measure of goodness of fit of the model; the latter indicated that the model fitted the data fairly well.

Using the multinomial logit regression coefficients, odds of preferences for the four methods namely, rhythm, condom, oral pill, and IUD as compared to sterilisation (as base 1) were calculated for each dimension of contraceptive choice. The paragraphs below describe the results of the analyses.

Contraceptive Goal and Method Choice

The contraceptive goal, it may be recalled, has been defined as the ultimate fertility that a woman or a couple desires to achieve through contraception. Thus, a contraceptive goal value of 1 was taken to indicate that the fertility goals of the woman are very definite and characterised not only by a desire to have no more children but also a strong desire to terminate childbearing (vide factor loading for these two variables in Table 2). A value of 2 on

TABLE 3
Multinomial logit regression coefficients and Z-statistics of rhythm, oral pill, condom and IUD

Method dimension	Rhythm	Oral Pill	Condom	IUD
Goal	-0.080	-0.598**	-0.098	-0.271*
	(-0.492)	(-2.601)	(0.675)	(-1.989)
Competence	-0.161	0.274	-0.568**	-0.352*
	(0.905)	(1.197)	(-3.092)	(-2.47)
Evaluation	-0.193	-0.152	-0.052	0.345*
	(-1.150)	(0.629)	(-0.336)	(1.988)
Access	-0.134	0.388	-0.179	-0.205
	(-0.834)	(1.632)	(-1.341)	(-1.508)

* - Values significant at 0.05 level; ** - Values significant at 0.01 level
Goodness of-Fit Test Statistics
Likelihood ratio Chi-square - 10.49, d.f. - 44, P-1.00
Pearson Chi-square - 35.63, d.f.- 44, P-0.81

the other hand, indicated the flexibility of the contraceptive goal, characterised by a desire to have additional children as also to space births rather than to terminate them.

Table 4 gives the odds of preference for the rhythm, condom, oral pill, and IUD as compared to sterilisation. The findings show that other factors being equal, the odds for using the rhythm method, condom, oral pill, and IUD increased to 1.1736, 3.3069, 1.2165 and 1.1794 respectively as compared to sterilisation in the case of respondents whose contraceptive goal was flexible. The odds of preference of these methods in the case of respondents who had a definite contraceptive goal were found to be 0.8521, 0.3024, 0.8220 and 0.5816 respectively.

While the relationship was in the expected

TABLE 4
Odds of preference for rhythm, oral pill, condom and IUD compared to sterilisation

Method dimension		Rhythm	Oral pill	Condom	IUD
Goal	1	0.8521	0.3024**	0.8220	0.5816
	2	1.1736	3.3069**	1.2165	1.1794
Competence	1	0.7247	1.7298	0.3210**	0.4946*
	2	1.3799	0.5781	3.1153**	2.0218*
Evaluation	1	0.6798	0.7379	0.9012	1.9937
	2	1.4712	1.3552	1.1096	0.5016
Access	1	0.7649	2.1728	0.6991	0.6637
	2	1.3047	0.4602	1.4304	1.5068

* - Values significant at 0.05 level. ** - Values significant at 0.01 level.

direction, it was found to be statistically significant only in the case of the oral pill indicating thereby that preference for the oral pill would reduce about three times as compared to sterilisation with a shift in the contraceptive goal from a flexible to a definite one. In other words, users of the oral pill are those who definitely do not want to terminate childbearing but would certainly want to space births. In such a situation then, they would not be expected to prefer less efficient methods such as the rhythm and condom though their contraceptive goal is flexible.

Contraceptive Competence and Method Choice

Contraceptive competence or the ability to use a particular method efficiently is associated with higher education, and high levels of contraceptive knowledge and interspousal communication (vide factor loading for these variables in Table 2). Based on the scores computed from the factor analysis, the respondents were categorised into two groups. A contraceptive value of 1 was considered to indicate a low level of competence while a value of 2 suggested a high level of contraceptive competence. The findings showed that in the case of respondents who had a high degree of competence in matters relating to contraception, the odds of preference for the rhythm method, condom and IUD increased to 1.3799, 3.1153 and 2.0218 respectively, whereas that for the oral pill declined to 0.5781. The relationship was statistically significant in the case of the condom and the IUD.

That the condom is a method which demands a higher degree of efficiency on the part of the user in order to be effective, was well proven by our findings that the odds of preference for the condom as compared to sterilisation were higher when the respondents were more competent. Again, though the IUD requires only a one-time motivation (prior to insertion), and does not require any active involvement on the part of the user, IUD users are required to be aware of its side effects, and also after how many years it should be removed/replaced. And, competence is important for the use of the rhythm method as well because the user is expected to record her menstrual cycle and calculate the 'safe' days; this is particularly important if the woman has irregular cycles.

Contraceptive Evaluation and Method Choice

As mentioned earlier, we addressed only one variable - that of the fear of side effects - as representative of contraceptive evaluation though it includes both the moral and practical implications of method use. A contraceptive evaluation value of 1 was taken to indicate better method evaluation in that the respondent was not apprehensive of the side effects of family planning methods, whereas a value of 2 suggested poor evaluation and that the respondent was afraid of side effects.

Table 4 also indicates that the odds of choosing the rhythm method or the condom increased to 1.4710 and 1.1096 respectively in the case of respondents who were apprehensive of the side effects of contraceptives. This is obvious: since neither method is known to have any side effects, the respondents preferred these methods as compared to sterilisation. While the relationship was not in the expected direction with regard to the pill, contraceptive evaluation did make an impact in the case of the IUD. Thus, the odds of preference for the IUD increased from 1.9937 to 1 as compared to sterilisation among those respondents who were not apprehensive about its side effects, indicating thereby that all other factors being equal, contraceptive evaluation plays an important part in determining the choice of IUD.

Contraceptive Access and Method Choice

The last dimension of the four-dimensional model, contraceptive access has two aspects to it namely, the existence of a family planning programme, and the adequate availability of family planning methods. It must however, be noted that income of an individual does not only increase the chances of his/her accessibility to a method in terms of being able to pay for obtaining the service, but increases his/her social and economic status which in turn, may influence his/her outlook including the desire to gain knowledge and have access to knowledge. In the case of the rhythm method, the dimension of accessibility needs to be understood in this context.

A value of 1 with regard to contraceptive access was taken to indicate poor access to contraceptive services and a value of 2 indicated better access. The analysis revealed that the access dimension did not have any significant role to play as shown by the odds of preference for any of the four spacing methods considered as compared to sterilisation. This suggests that when people are self-motivated and acceptance of family planning is voluntary, the presence of a family planning centre does not influence the selection of family planning methods. However, the trend of method selection as revealed in the analysis indicates that those with better accessibility prefer the IUD and condom, and also practice rhythm. These findings are in the expected direction except in the case of the pill.

Discussion

Overall, the study reveals that while in the selection of the oral pill, contraceptive goal related factors play an important role, in the case of the condom and IUD, contraceptive competence appear to have a more significant influence. While none of the four dimensions of contraceptive choice were found to be statistically significant in choosing the rhythm method, the trend of the relationship clearly suggested an expected pattern.

Significantly, in the study population, accessibility did not seem to be an important factor in determining the choice of different contraceptives. This finding may not hold true in the case of a rural population where self-motivation to accept family planning is likely to be very low. It may be mentioned that accessibility was defined in terms of the awareness of the location of the government family planning centre in the colony. In a population that is highly motivated and has access to several private outlets, this dimension does not justifiably capture the issue of accessibility. Further studies are therefore needed to understand the significance of accessibility in promoting the use of spacing methods in the context of low motivation and low affordability of rural populations.

Finally, it must be mentioned that while an attempt has been made to capture the four dimensions of contraceptive choice, their precise measurement cannot be claimed. The study has clearly established though that the selection of each method has its own set of determinants. In view of this, it is suggested that future strategies aimed at promoting spacing methods should be highly focussed and not widely diffused.

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Family planning knowledge, interest and information needs of district officials in Uttar Pradesh*

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Introduction

The Indian family planning programme, though one of the oldest in the developing world, has not made the desired impact. Research and evaluation studies have shown that the country's Northern belt comprising the four states of Rajasthan, Uttar Pradesh, Bihar and Madhya Pradesh, has the poorest family record. The current fertility in these four large states, where 40 per cent of India's population lives, is still very high, and nowhere near the country's goal.

Uttar Pradesh is the most populous state in India and ranks among the lowest in terms of demographic and socioeconomic indicators. In 1991, it had a population of 140 million or 16 per cent of India's population, and a density of 472 persons per sq.km. The decennial growth rate (1981-91) was 2.3 per cent and 19.8 per cent of the population was urban. The 1991 census also showed that the state had the lowest literacy rate (41 per cent) in the country except for Bihar, as also the highest crude birth rate (35.7 per 1000 population in 1990) and infant mortality rate (98 per 1000 live births in 1990), barring that of Orissa and Madhya Pradesh. The family planning programme in the state is implemented with the support of the necessary infrastructure that exists in other states, and yet, Uttar Pradesh has one of the lowest couple protection rates in India (33.1 per cent). The Sample Registration System reported a total fertility rate of 5.4 per woman in 1988.

This poor demographic and socioeconomic picture is a major reason for the USAID initiating a new project called Innovations in Family Planning Services (IFPS) focusing on the state as a primary programme site. It is in this context that we considered it important to identify the perceptions of district officials about the importance of family planning and the reasons for

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** The views expressed in this paper are exclusively those of the authors and do not reflect those of the Government of India or of the National Institute of Health and Family Welfare.*

the lack of success of the programme in Uttar Pradesh. Such information, we felt, would be useful in developing services to raise awareness about fundamental family planning programme components, strengthening the commitment of state leaders and programme implementors, developing a consensus for policies and programmes at different management and technical levels, and providing information for designing innovative strategies for future programme implementation.

Objectives

The overall objective of the study thus, was to collect information on the perceptions of district officials about the programme and its poor performance for designing future programme interventions in Uttar Pradesh that would help build a strong base for an effective family planning programme. Specifically, the intention was to:

1. gain an insight into the knowledge, understanding, interest and information needs of district officials from Uttar Pradesh regarding the systematic implementation of the family planning programme, and
2. obtain a feedback from the district officials on reasons for poor programme performance and suggestions for innovative strategies for improving it.

Study Design and Methodology

Five districts from different parts of Uttar Pradesh namely, Meerut, Kanpur (Nagar and Dehat), Dehradun, Allahabad and Jaunpur were purposively selected to give a range of conditions across the state.

The selection of officials was based on their designation and past involvement in the family planning programme in the state. A total of 27 key officials from the Health and Administrative Departments who were involved in the implementation of the family planning programme at the district level were selected and interviewed during July 1993. The health officials were the Regional Additional Director-Health (AD/R), Chief Medical Officer (CMO), Deputy Chief Medical Officer - Family Planning (Dy, CMO), and the District Health Education & Information Officer (DHEIO), while the administration officials included the Commissioner, District Magistrate (DM), and the Additional District Magistrate-Planning or the Chief Development Officer (CDO).

Structured interview approach

The study used two methodologies for collecting information: structured interviews and questionnaires. Structured interviews of the selected officials were conducted by a two-person interview team with the help of an interview protocol. The main topics and issues included in the guide were:

1) Support and relevance of the family planning programme and relationship of rapid population growth and development.
2) Knowledge of national family planning programme goals.
3) Perceptions about programme implementation issues: targets, incentives, budgets, method mix, IEC, monitoring and supervision.
4) Strengths and weaknesses of the family planning programme.
5) Need and feasibility of including NGOs, private sector, industrial sector, cooperatives, and other organisations in the family planning programme.
6) Innovations and other strategic approaches that have worked at the district level to make the family planning programme more effective.
7) Interest of district officials on topics such as method mix, source mix, quality of care, and demand for family planning.

The interviewers engaged the participants in a free-flowing discussion using the protocol as a guide. They were, however, free to depart from the protocol to explore particular areas in more detail or to explore new issues that might arise during the interview. This approach provides an in-depth understanding of the participants' views, and is more useful than the survey approach, for assessing the participant's knowledge, attitudes and beliefs. However, the results need to be interpreted with caution, since they are not representative of the general population or even of all officials at levels similar to that of the participants. The views expressed by the officials were pooled under each of the identified components of the family planning programme.

Questionnaires

The views and perceptions of district officials were also collected by canvassing a questionnaire to officials from the departments of health and family welfare and allied sectors such as education and social welfare, and to a few NGO representatives who participated in one-day workshops on the presentation of the RAPID model[1], which was designed to show the consequences of rapid population growth on social and economic development in Uttar Pradesh. The workshops were held in the districts of Meerut, Agra, Jhansi, Allahabad and Varanasi.

The semi-structured questionnaire covered the following topics:

a) Population growth versus social and economic development.
b) Importance of family planning vis-a-vis development.
c) Achievements of the family planning programme, major weaknesses and components which need to be strengthened.
d) Implementation issues relating to the family planning programme - method mix, demand for services, different service channels and their accessibility for different population groups.
e) Promotion of the family planning programme.

Following each RAPID model presentation and discussion, the participants were given the questionnaire to complete. The total number of responses thus collected were 140. The number of responses by district was - Meerut: 34; Agra: 14; Jhansi: 36; Allahabad: 22; and Varanasi: 34. The workshops were held in July and August, 1993.

Results and Discussion

Since the findings of both the approaches were consistent, the discussion in the following paragraphs combines the results of both the interview and questionnaire outputs.

A. PERCEPTIONS OF DISTRICT OFFICIALS

1. Significance of and Support for the Programme

Most of the officials, irrespective of their designation and affiliation, perceived the family planning programme as the "most important programme". They understood the potential impact of rapid population growth on development efforts, and believed that it impedes social and economic development. In fact, they believed that the family planning programme was even more important than development; only a few thought the contrary. They also believed that population control was the best solution for reaping the benefits of limited resources and development programmes. Most officials felt that family planning is a good investment, except for a few who described the pro-gramme as a saline injection that only offers short-term relief but no cure. These respondents believed instead that development programmes emphasising female education were the only way to ensure long lasting changes in attitudes towards a small family norm. However, all other officers were convinced that the family planning programme should get the highest priority for the survival of the country.

As regards the other sectors such as agriculture, education, employment and so on, the respondents expressed the need for improving the general educational status of the population, and especially that of females. Participants from both sides of the programme (health as well as administration) reiterated the need for emphasising female education. They suggested that literacy and family planning programmes can go parallel to each other so that both get equal priority.

In their opinion, the investments made so far on the family planning programme were justifiable from every angle. However, many were of the opinion that the programme had not achieved its desired impact due to the lack of effective implementation. The outlay was considered as more than adequate by officials of the administrative division: the Commissioners, District Magistrates and Chief Development Officers opined that there was no shortage of funds, and several restated the need to use the existing resources and infrastructure effectively. The majority of the health and family welfare officers, on the other hand, felt that the expenditure incurred on family planning was not adequate, and this was the reason for its poor service quality. They (94 per cent) felt that the family planning budget should be increased and expanded.

Overall, the responses of the officers indicated that they had an adequate understanding of the need, importance and impact of the family planning programme.

2. *Programme Goals*

Most of the officials were not clear about the national goals of the family planning programme and confused them with programme targets.

3. *Programme Implementation*

It was felt that neither administrative nor family planning programme implementors were happy about programme implementation. Discussions on targets, incentives, budgets, method mix, the role of other agencies, and IEC activities are described in more detail in the following paragraphs.

a) Targets

The respondents acknowledged that targets are essential for the programme but described them as a 'necessary evil'. In their opinion some of the problems associated with the concept of targets are:

i) *Too much chasing after targets:* This has resulted in

- inflated reporting of sterilisation cases
- lower quality of services (very little attention to proper examination and follow up)
- lower quality of acceptors (older age couples and higher parity couples).

An explanation offered for the lack of demographic impact of the programme was the over-reporting of sterilisation cases. On probing, some health officials admitted to 60-70 per cent of fictitious sterilisation case reporting from their districts. Only one district was an exception where evaluation had revealed almost no false cases: it seems that the pressure of achieving sterilisation targets has been withdrawn from this district since the last two years and greater emphasis is placed on assessing case authenticity.

ii) *The assessment of programme achievement in terms of sterilisation or equating contraceptive users to sterilisation cases:* This has affected the programme adversely in two ways. First, no systematic approach has been adopted by the field workers to spread knowledge and use of the small family norm to generate a voluntary demand for family planning services. Secondly, spacing methods have been neglected and the cafeteria approach has remained on paper only. This again has resulted in excluding a large number of young couples with no child or up to two children from the programme.

iii) *Over-ambitious targets for the districts:* Administrative officials strongly believed that the targets were achievable if the health department effectively supervised performance and provided follow-up services. Officials from the health department were mostly in disagreement with this viewpoint. One official felt that given adequate staff based on the terrain and remoteness of population groups, targets could be achieved in his region. He suggested that the targets be modified in view of the actual staff available in the field.

iv) *Interaction of reproductive health issues and demographic targets:* The officers felt that the scope of the targets needed to be broadened to address reproductive health issues; the pressure of achieving demographic objectives had weakened the programme in terms of its addressing the needs of women and children. Some modifications in targets suggested were:

- the targets should be in terms of educational activities conducted: 'process indicators' (health officials)
- the targets should address the ultimate goal of birth reduction (administrative and health officials)
- the targets for spacing methods should be given equal emphasis and should be in terms of "users" and not contraceptives distributed.

2. Budget

The budget was a constraint (94 per cent of respondents) for effective programme implementation according to the health officials. They were constrained by the overall allocation of drugs for family planning activities and by the inflexibility of reappropriating funds at the district level. They were very specific when they reported that the first five important components of the programme which required more funds were:

Information, education and communication
- Quality of services
- Petrol, Oil and Lubrication (POL) and transport
- Medicines
- Training

The health officials felt that field visits and supervision of field staff was severely compromised by the lack of an adequate POL budget. The administrative officials were not supportive of increasing the family planning budget and were critical of doctors who misused the vehicle for personal reasons. A good number of programme officials felt that the expenditure on certain components of the programme could be reduced, especially, the incentives paid to acceptors and motivators, and reappropriated to the components listed above.

3. Incentives

On the question of incentives, both administrative and health officers were very sore. In their opinion, incentives have been the biggest source of malpractice in the implementation of the programme. Provider incentives have resulted in the reporting of inflated figures, non-serious attitudes and lack of commitment on the part of the staff.

The opinion of the respondents on continuing acceptor incentives was divided. A few officials stated that not only should incentives be abolished but the acceptors should be required to pay a fee for obtaining sterilisation services. Providing incentive money and free services had created a feeling among the acceptors that the health providers have a vested interest in providing the service, rather than realising that the use of the method was beneficial to them.

Another group of officials believed that stronger disincentives needed to be enforced for which legislative changes would be required. This would encourage couples to adopt an attitude of "responsible parenthood". It was also suggested that it would be advantageous to institute strong incen-

tive schemes for re
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methods that might act as disincentives for non-users of family planning. The officers even went to the extent of stating that for a state like Uttar Pradesh, only the China model would produce results.

On the other hand, some health officials suggested that the acceptors should be given normal programme incentives whereas for service providers and motivators they should be discontinued. Another issue raised was the "additional incentive" offered by other departments such as the Revenue and Planning Departments. The respondents from the Health Department were of the firm belief that this affected the quality of the programme and the acceptors were tempted to wait until they could benefit from the incentive schemes.

4. *Method Mix*

Respondents from both the Administration and Health Departments reported that the emphasis was on sterilisation. It is important to note that inspite of stressing the role of permanent methods in the Indian context, this was also considered as the major drawback in programme implementation. The majority of the officials were of the view that an appropriate method mix was important to achieve the demographic goals and suggested that the thrust should be on spacing methods (health officials) especially for younger and newly married couples. However, officials from both departments were concerned about regular supplies of contraceptives in the field, and the verification and continuity of contraceptive use by the acceptor.

Both groups of officials also stressed the need for follow up services. The common impression was that the acceptors need to be literate to accept spacing methods and to be able to continue their use. The Health officials also stressed that an improvement in programme; the demand for family planning could be increased by adding injectables and the once-a-week pill to the gamut of spacing methods, and this might specifically benefit the minority community.

On the question of knowledge about different contraceptives, administrative officials saw gaps in the knowledge of workers, and called for providing more information to the concerned staff. On the other hand, health officials were mostly satisfied with their knowledge, though they did desire to seek more information and knowledge on new contraceptives such as the injectables and once-a-week pill.

5. *IEC Activities*

Information, education and communication activities have been the most neglected component of the programme. This view as universally supported by officials from both departments. The views of administrative officials were very discouraging. In their opinion little has been done through IEC activities although they could have played a vital role in generating a greater demand for family planning services and instituting the small family norm. Within the health department the DHEIOs were dissatisfied with the support from the medical side and the CMOs and Dy. CMOs felt that the DHEIOs were not interested in working.

Among problems relating to IEC implementation reported by the concerned officials (DHEIOs) were the general apathy and unfavourable attitudes of medical professionals toward IEC activities, non-availability of both hardware and software needed for conducting the activities including vehicles, and an inadequate POL budget. The respondents made a few suggestions for improving programme performance:

- An educational approach should have 'Individual Benefit' as the nucleus instead of talking about the impact of a large population on the country or the world as a whole.

- There should be more stress on the interpersonal approach along with efforts to reach the population through the mass media.
- Indicators for programme success could be measured as the number of persons contacted, workshops held, meetings held, films shown, etc.
- A marketing approach along with demonstrations of available contraceptives should be adopted for educating people.

6. *Role of Other Agencies*

A majority of the respondents felt that tapping the potential of other sources of service delivery such as NGOs and the organised sector was important. Most of them were aware of the upcoming Innovations in Family Planning Services (IFPS) project. However, they were careful in stating the role of NGOs. Several CMOs were concerned about the number of letters they had ben receiving from NGOs in connection with the IFPS project. One of the respondents felt that NGOs should only be involved in selected activities such as education and monitoring. Thus, although they did see the need for involving committed and experienced NGOs, they were skeptical of the validity of many of the NGOs. They reiterated the need to ensure that careful selection and screening criteria were followed before involving NGOs on a large scale.

According to the respondents, women's cooperatives, the industrial and private sectors, and social marketing could play a limited role in programme implementation. The health officials also felt that the quality of the programme would be further jeopardised by involving traditional practitioners in rural areas, even if they were trained in contraceptive delivery. The administrative executives were strong believers in the need to incorporate other sectors and other departments, particularly those dealing with education and rural development. Some officials felt that youth clubs and rural women's groups could also play a vital role in increasing family planning acceptance.

The respondents felt that information on the following topics would be useful:

- how and to which elements of the family planning programme can the NGOs contribute,
- the operational mechanism of social marketing of condoms and pills,
- the role of industries; some successful experiences

7. *Monitoring and Supervision*

Almost all the officials pointed out that regular monitoring is very essential for improving programme effectiveness. Both administrative as well as health department officials appeared to be satisfied with the adequacy of reported statistics. They, however, stated that not much had been done about using it for two main reasons. First, either because the concerned officers are not aware of how these statistics can be used to improve programme performance or are not interested in doing so. And, second, that they are too busy chasing targets and do not get time to look into the reasons of good or bad programme performance. In this context, a good number of respondents suggested that there should be strict monitoring of the programme with a view to improving performance.

8. *Quality of Services*

The respondents felt that if some budget allocation could be made for those components which can improve the quality of MCH services, family planning and allied programmes, the credibility of the programme would improve. This will be an important step to gain greater acceptance of the services.

i) *Operational Barriers*

The administration officials believed that the main operational barrier was lack of efforts from the medical staff and health workers. These officers also felt that the family planning programme could have achieved much more if more attention had been paid to the systematic implementation of pro-gramme strategies. Referring to the low acceptance of family planning among some minority groups, they opined that not enough had been done to reach this target group with the services they were interested in. They admitted that there are certain cultural barriers to family planning acceptance which could be overcome by sustained efforts at:

- involving religious leaders and Moulvis to address these sensitive issues during their daily discourses.
- involving older family members, especially mothers-in-law. The administration officials felt that this could be an effective channel of communication instead of approaching only target couples who have limited freedom and are bound by the advice of the elders in the family.

The views of the health and family planning officials on operational barriers were different because they interpreted barriers as problems of implementation. Some of the problems mentioned by them were:

- non-adoption of family planning by illiterate and minority groups
- lack of political support
- political interference which prevents effective programme administration and promotes a casual attitude of staff towards work
- non-performance of responsibilities and duties by male workers
- lack of field visits by ANMs
- residence of doctors outside or away from the place of their posting
- involvement of other departments resulting in a damage to the programme image
- lack of mobility faced by the doctors at the PHC and CHC due to shortage of POL budget
- incentives resulting in malpractice and over-reporting of performance figures
- shortage of supplies of medicines and contraceptives like pills and IUD
- lack of commitment and dedication among field staff

All the respondents believed that there is a demand for family planning services but that the people do not come forward to use the services. On probing, they admitted that misconceptions existed about contraceptive methods among both providers and the general population and should be addressed.

ii) *Programme Strengths and Weaknesses*

All the respondents expressed dissatisfaction with programme performance. In their opinion, the status of the programme is very low and in some districts drastic efforts are needed to uplift the programme image and performance. Further, most of the officials felt that the family planning programme has not achieved the desired results because of various reasons and weaknesses. Most of the weaknesses listed below have already been mentioned earlier; a few issues raised repeatedly are given below:

- the programme is target oriented
- service quality is poor and follow-up is inadequate
- family planning cases are not selected properly
- inadequate or very little emphasis on spacing methods
- illiteracy, especially among adult females
- programme monitoring is not done correctly
- lack of IEC activities

- lack of interest and worker commitment
- lack of supervision and support by the senior doctors (the doctors are busy with their private practice and choose to reside at the district headquarters). For instance, one CMO mentioned that 57 medical officers were given transfer orders (for indulging in private practice) in his division but only seven officers had actually been transferred. The rest had managed to stall the transfer proceedings through their political connections.

The main strength reported by the respondents of the administrative branch was the existence of a vast health and family welfare infrastructure, whereas the health officials reported that all the inputs of the family planning programme contributed to the strength and could isolate no single factor.

The health officials were critical of the involvement of other departments like those of Revenue and Planning in the family planning programme; they felt that this affected the quality of the cases that were recruited for sterilisation - quality was compromised because the administration did not understand the linkages between age, parity and fertility decline and were only concerned about meeting the specified targets. Additionally, these respondents complained that educational and motivational activities had not been carried out systematically along with service provision to overcome the barrier of female illiteracy. They suggested that besides taking care of the weaknesses listed above, strengthening of MGH services, IEC, improving the quality of family planning services and follow-up care, improving female literacy, removing religious and social stigmas attached to family planning acceptance by involving religious and political leaders, retraining of staff and strict monitoring for improving programme effectiveness.

B. INFORMATION NEEDS OF DISTRICT OFFICIALS

The findings discussed above clearly reveal that the officials of both the Administration and Health Departments attach a great deal of significance to the population problem and the family planning programme. They have a good understanding of the linkages between population growth and socioeconomic development, as also the various programme components such as services, supplies, IEC, the involvement and role of other departments, and so on. However, their interest in the systematic implementation of the programme is lacking. There is a general apathy toward IEC activities, especially activity planning and work scheduling for interpersonal contacts, and towards the involvement of and the role of NGOs, the industrial sector, women's groups, etc. Our discussions show that district level officers need:

a) Information to remove misconceptions about spacing methods, and information on new methods.
b) Techniques of monitoring the family planning programme including some orientation on the assessment of regular users of spacing methods.
c) The effective use of available statistics and the importance of regular monitoring.
d) Information about the national goals and their application at the district level; the methodology of target setting; targets for educational activities; indicators for measuring birth reduction goals.
e) Success stories in family planning within the country and in other countries as case studies; the implications of the China model for India.
f) Examples from other states or countries demonstrating the role of NGOs, the industrial sector and private practitioners,

as also of social marketing in family planning service delivery.

g) Information on the relationship between age, parity and fertility impact; components of quality of services and impact on the family planning programme.

C. THEMES TO BE COVERED FOR STRENGTHENING ACTIVITIES AIMED AT MOBILISING PROGRAMME SUPPORT

The majority of the participants of the workshops was in favour of mobilising the support of politicians, journalists and bureaucrats for the success of the programme. The topics which they felt should be discussed with these specific groups are given below:

Politicians

1. Population growth and its effect on social and economic development.
2. Importance of family planning programme in population control.

Journalists

1. Importance of family planning programme in population control.
2. Highlighting the benefits of the programme.

Bureaucrats

1. Monitoring of the family planning programme, especially on a qualitative basis.
2. Proper and effective implementation of the programme.
3. Stress on spacing methods.

Conclusion and Recommendations

The responses obtained from district officials of both the Administration as well as Health and Family Welfare Departments, lead us to conclude that there is an urgent need to eliminate existing information gaps by meeting the information needs of both administration and health officials of the family planning programme. The following emerge as recommendations:

1. One-day workshops should be held to get both district level administrators and health officers on the same wavelength with regard to the programme, and to discuss their problems openly. It may be necessary to bring administrators from districts different from those to which the health officers belong.
2. Workshops should also be held to orient health and family welfare programme officers with regard to the information listed in Section B above. These workshops should also demonstrate how the eligible couple and child registers (ECCR) can provide very useful information to grassroots workers for setting their own targets and making their work plans.
3. Grassroots level workers should also be oriented in the use of ECCRs and trained to use them. In order to impart such training, the training of district level trainers will have to be undertaken first.
4. The district level staff appreciate the role that NGOs and the industries can play in accelerating the programme. Such appreciation can be used to strengthen their efforts for involving these two important sectors in the programme.
5. There is a need to mobilise the support of politicians, journalists and bureaucrats. Section C suggests some of the major topics which need to be discussed with them.

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Determinants of contraceptive use in Kerala: The case of son/daughter preference

Dr. V. Gopalakrishnan Asari

The preference of couples worldwide for a male or female child is an age-old phenomenon. In many developing countries, including India, the preference for sons is strong and has influenced fertility to a large extent. Again, there are also reports[1-3] which indicate that in countries where a strong son preference exists, it has only had a weak or, at most, a moderately strong effect on fertility and family planning practice. Nevertheless, son preference is prevalent in many less developed countries, particularly in the rural areas where sons are often priced as assets for working on the family farm, as providers of security in old age, and so on. Son preference thus, has affected the success of family planning programmes by acting as a significant barrier to rapid fertility decline in these countries.

Couples also tend to continue to have children if they have not achieved the number of children of a preferred sex. That is, if the preference for sons is stronger than family size preference, couples would hesitate to accept contraception, and particularly a permanent method such as sterilisation. Analysing data from Kerala, Ramakumar[4] observed that son preference among couples though existent was not strong enough to influence family size limitation decisions, while Suchindren and others[5] observed that when there were proportionately more children of the same sex there was a strong tendency to accept sterilisation. A study[2] based on world fertility data has shown that sex preference need not have a powerful influence on fertility as the average family size declines. That is, couples tend to accept contraception in order to reduce family size irrespective of the sex of the children they have. The recent fertility decline in Kerala is independent of any gender preference, particularly son preference among couples. The present paper intends to examine the preference for sons or daughters among couples in Kerala, which could have influenced their fertility.

Sample and Methodology

The data used in the study were drawn from a survey of teacher couples in Kerala, conducted in 1991. The sample comprised a randomly selected sample of 502 female, high school teachers from almost all the 14

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districts of the State. A schedule was used to collect information about their demographic and socioeconomic characteristics.

Sex or gender preference was measured by an improved method of Ramakumar,[6] based on that of Arnold[2], whereby an index was constructed to measure sex preference and family size preference separately in terms of the contraceptive acceptance rate. When calculated parity-wise, it measures the strength of family size preference among couples in the absence of son or daughter preferences and their difference as gender preference (sex preference).

According to this method, the index of family size preference, ignoring the number of daughters the couple has, but considering only the number of sons, is given by

$SP(F) = \frac{Pi\ Si}{Pi} X100,$ where Pi is the number of women of 'i'th parity and Si is the proportion of women having 'i' sons accepting contraception, irrespective of the number of daughters they have. Similarly, family size preference ignoring sons, but taking into consideration only daughters, irrespective of the number of sons is given by

$SP(M) = \frac{PiSi}{Pi} X100,$ where Di is the proportion of women Pi having 'i' daughters, irrespective of the number of sons they have.

The measure of sex (gender) preference or SP is given by SP(F) - SP(M). The preference for a child/children of one sex over the other will also be reflected by this measure.

Results and Discussion

Table 1 presents a distribution of the respondents by number of living children and the contraceptive method used. The contraceptive acceptance rate was 49.8 per cent. A marginal 1.8 per cent of the couples had resorted to MTP to prevent an unwanted pregnancy, and 48.4 per cent reported that they were not using any method. The latter information may not be wholly reliable as the respondents may suppress such information. As expected, among family planning acceptors, contraceptive acceptance, and particularly sterilisation, increased with the number of living children. As many as 62 per cent of the users had accepted a permanent method indicating a strong motivation to limit the family size to two: almost three-fifths (59 per cent) of all sterilisation acceptors had two children, followed by 38 per cent who had three children, the remaining 3 per cent had one or four or more children. Among the spacing methods, the condom was the most preferred - used by 69 per cent of the spacers (Table 1).

Table 1 also indicates whether the acceptors were using the family planning method for spacing or limiting births. While 2.8 per cent or 7 of the 250 acceptors did not specify whether they were practising family planning for spacing or limiting births, the majority of those who did respond (205 or 82 per cent) stated to have been using a method to limit future births; only 15 per cent were doing so for birth spacing. Considering that 133 (88 per cent) of the 150 two-child acceptor couples were practising family planning to limit births, only 92 (61 per cent) had accepted a terminal method. On the other hand, while only 14 couples (9 per cent) stated that they were using a method to space births as many as 58 (39 per cent) were using a spacing method; the condom was used by about 25 per cent of all users and 69 per cent of the spacers. Interestingly then, the condom was apparently being used to a greater extent than the IUD or the pill to prevent future births.

Two-child families were predominant in the sample among both users and non-users of family planning, followed by couples who had three children. Of the 243 couples who were not using any method, over half had two children while a fifth had three or more children. Conforming with this obser-

TABLE 1
Distribution of FP users and non-users by living children, FP use with reason, and MTP

No. of living children	Non-FP users	Contraceptive method used					MTP	Contraception used for*			Total respondents
		Condom	IUD	Oral pill	Sterilisation	Total users		No response	Spacing births	Limiting births	
0	7	4	-	-	-	4	2	1	3	-	13
1	45	9	6	5	2	22	2	-	15	7	69
2	138	40	5	13	92	150	5	3	14	133	293
3	43	7	-	1	59	67	-	3	5	59	110
4	8	1	1	-	2	4	-	-	-	4	12
5	2	2	-	-	1	3	-	-	1	2	5
Total	243	63	12	19	156	250	9	7	38	205	502
		(25.2)	(4.8)	(7.6)	(62.4)	(100.0)	(1.8)				

Average number of children: 2.16

* N = 250 who were using a FP method (sterilisation, IUD, pill or condom).

vation was their expressed desired family size: the average number of children desired by the respondents was 1.94, and the average ideal number of children was 2.02 children (Table 2). As against this, the average number of living children was slightly higher, at 2.16.

TABLE 2
Distribution of respondents by desired and ideal family size

No. of living children	No. of respondents	
	Desired family size	Ideal family size
1	7	7
2	148	117
3	56	31
4	16	10
5+	7	2
Total	234	167

No response was received on the desired and ideal family size for 268 and 335 women respectively. Desired family size (mean): 1.94 Ideal family size (mean): 2.02

This shows that the ideal and desired family sizes as expressed by the respondents were not very different (though over 50 per cent did not provide this information), and that the couples, by and large, were practising family planning successfully to attain their desired as well as ideal family size goals.

Sex combination of children and contraceptive use

Table 3 gives a distribution of the respondents by the sex combination of children and contraceptive use. The findings show that among the 29 acceptor couples who had two daughters only, over half (18 or 62 per cent) had accepted sterilisation and the remaining 11 (38 per cent) were using a temporary method of contraception. When the total sample was considered, a third of all couples with two daughters and no sons were found to have opted for sterilisation. The corresponding percentages for 'two sons-only' couples were 59 per cent for permanent method acceptors and 41 per cent for temporary method acceptors, almost the same as for 'two daughters-only' couples. Among the 84 acceptor couples who had a one-son-one-daughter combination too, an almost equal proportion were using temporary and permanent methods.

Further, among both two-child and three-child couples (there were very few couples with four or more children), irrespective of the sex combination, a significantly greater proportion of acceptor couples were likely to opt for a terminal method. The percentage of sterilisation acceptors among acceptors increased with the number of children:

TABLE 3

Distribution of respondents by sex combination of children and contraceptive use

Sex combination	Acceptors of			Non-acceptors	MTP cases	Total respon-dents
	Permanent method	Temporary method	Total			
1	2	3	4	5	6	7
No children	-	4 (30.8)	4	7 (53.8)	2 (15.4)	13 (100.0)
One child						
1 daughter	-	7 (21.2) [100.0]	7 [100.0]	24 (72.7)	2 (6.1)	33 (100.0)
1 son	2 (5.6) [1.3]	13 (36.1) [86.7]	15 [100.0]	21 (58.3)	-	36 (100.0)
Two children						
2 daughters	18 (34.6) [62.1]	11 (21.2) [37.9]	29 [100.0]	21 (40.4)	2 (3.8)	52 (100.0)
1 daughter, 1 son	52 (30.9) [61.9]	32 (19.1) [38.1]	84 [100.0]	82 (48.8)	2 (1.2)	168 (100.0)
2 sons	22 (30.1) [59.4]	15 (20.6) [40.6]	37 [100.0]	35 (48.0)	1 (1.3)	73 (100.0)
Three children						
3 daughters	8(100.0) [100.0]	- [100.0]	8	-	-	8 (100.0)
2 daughters, 1 son	27 (50.9) [87.1]	4 (7.6) [12.9]	31 [100.0]	22 (41.5)	-	53 (100.0)
1 daughter, 2 sons	19 (50.0) [86.3]	3 (7.9) [13.7]	22 [100.0]	16 (42.1)	-	38 (100.0)
3 sons	5 (45.4) [83.3]	1 (9.1) [16.7]	6 [100.0]	5 (45.5)	-	11 (100.0)
Four children						
3 daughters, 1 son	2 (28.6) [66.7]	1 (14.3) [33.3]	3 [100.0]	4 (57.1)	-	7 (100.0)
1 daughter, 3 sons	-	1 (33.3) [100.0]	1 [100.0]	2 (66.7)	-	3 (100.0)
2 daughters, 2 sons -	-	-		2(100.0)	-	2 (100.0)
Five or more children	1 (20.0) [33.3]	2 (40.0) [66.7]	3 [100.0]	2 (40.0)	-	5 (100.0)
Total	156 (31.1) [62.4]	94 (18.7) [37.6]	250 [100.0]	243 (48.4)	9 (1.8)	502 (100.0)

Figures in brackets [ ] Columns 2 and 3 indicate row-wise percentages of total acceptors in each sex combination category.

Figures in brackets ( ) indicate row-wise percentages of all respondents in each sex combination category.

59-62 per cent among two-child couples and over 83 per cent among three-child couples had accepted sterilisation. Even among acceptor couples with four or more children, though the sample size was small, a significant proportion had accepted sterilisation. Thus, the decision to accept a permanent method was apparently influenced by a preference for family size than a preference for either male or female children.

This was true even in the case of couples who had three daughters only: eight out of ten had accepted sterilisation, indicating a preference for family size over sex of children.

Among single-child acceptor couples, as expected, acceptors of temporary methods predominated (91 per cent). While all the 7 couples with an only daughter were using a spacing method, 13 of the 15 couples who had one son were doing so (the remaining two had accepted sterilisation). This was true even when all single-child couples were considered, that is, among all the 69 single-child couples, a higher percentage of couples with one son (36 per cent) than couples with one daughter (21 per cent) were spacing births to postpone the next pregnancy. Ramakumar,[4] in a study in Kerala, also observed that acceptors of non-terminal methods were proportionately greater in number when the single child was a son as compared to a daughter. That couples with an only son were more likely to contracept than those with an only daughter, though suggestive of son preference, was insignificant. Further, that couples who had an only female child had not undergone sterilisation (two of the 15 'only-son' couples had done so), does not indicate son preference in this small number of couples; rather, it is a chance factor. As discussed earlier then, once the preferred family size of two children, whether male or female, is achieved, the couples tend to accept a permanent method. Also, as observed, when parity increases, family size seems to take precedence over gender preference in making contraceptive decisions.

Gender preference and contraceptive use

Table 4 presents the gender preference values among users and non-users of contraceptives at each parity. The findings indicate that for those who had accepted a family planning method, the measure of size preference was 51.28 when sons were preferred and 51.84 when a daughter was preferred. The difference between the two values, that is - 0.56, indicated a slight preference for daughters. Among adopters of a permanent method, the corresponding values were 31.27 and 32.06 respectively, the

TABLE 4

Contraceptive use rates by sex preference of children by FP users and non-users

Number of sons/daughters	Permanent Method users *Preference for*		Temporary Method users *Preference for*		Total users *Preference for*		Non-users *Preference for*		No. of cases
	Son	Daughter	Son	Daughter	Son	Daughter	Son	Daughter	
1	5.56	-	36.11	29.03	41.67	29.03	58.33	70.97	69
2	31.09	32.41	20.58	22.22	51.68	54.62	48.32	46.75	293
3	50.00	53.47	7.84	6.93	57.84	60.40	42.15	39.60	110
4	16.67	16.67	16.67	16.67	33.33	33.33	66.67	66.67	12
5+	20.00	20.00	40.00	40.00	60.00	60.00	40.00	40.00	5
Size preference values	31.27	32.06	20.01	19.79	51.28	51.84	48.71	50.98	489 *
Sex preference values	- 0.79		+ 0.22		- 0.56		- 2.27		

13 respondents who had no children were excluded.

difference of - 0.79 again indicating a slight edge over son preference.

On the other hand, the difference in the case of acceptors of spacing methods was - 1.47 (the values being 20.01 and 19.79 respectively), and suggested a slight son preference. However, the above differences did not show any clear-cut preference for sons but suggested that family size preference rather than gender preference was an important consideration for contraceptive use as reflected among couples having a marginal excess of daughters over sons. When all contraceptive users are considered, the margin of preference for sons over daughters is further reduced to a negligible value of 0.56.

The contraceptive use rates at each parity distributed by son and daughter preference were more or less equal among contraceptors with a slight preference for daughters which does not reflect any perceptible sex preference. Among non-users, the family size preference values were 48.71 in the case of son preference and 50.98 for daughter preference. The difference of -2.27 was slightly in favour of daughters, but insignificant.

Conclusion

Son preference as a determining factor in contraceptive acceptance and birth control is fast changing, especially in regions where fertility is on the decline. The educated and economically advanced sections of the society opt for small family irrespective of the number of sons or daughters they have. The present study indicates this manifestation in the practice of contraception and fertility in Kerala. Among educated couples aged 35 and below, the tendency is to have small families of two children. In the present sample of 502 teacher-couples, over 90 per cent had only two children. The ideal and desired family size was close to two.

Our findings suggest that family size preference is apparently more important than gender preference in determining contraceptive use - both, terminal and spacing methods. The lack of sex preference also confirms an absence of son preference, and the influence of family size preference on contraceptive use. This is perhaps inevitable because of improvements in the educational and economic conditions of different groups of people in the state over the years; moder-nisation is also known to influence the use of contraception due to a change from joint families to nuclear families. The characteristics of the sample population, that is, teacher-couples, is significant in this context. Further, with a decrease in the distribution of farm land among families, male children are probably no longer considered an asset. As a consequence, the fast decline in the fertility of the state is apparently occurring without a consideration for the sex of the child. The wide use of contraception and the acceptance of terminal methods after two children by couples reflect this. Further, the average number of children per couple in our sample, is just above two, and sons are no longer a preferred asset as compared to daughters.

The majority of contraceptors had accepted sterilisation. The study shows no preference for either sex among couples who practised contraception. The contraceptive use rate was higher among low parity women, especially at parity two, indicating a sustained effort by couples to regulate family size. In general, the tendency of acceptor couples was to use contraception not to space births in terms of preferred sex of the children, but to limit family size.

The conclusion that can be drawn from this study then is that gender preference does not determine contraceptive practice especially among the educated and socially advanced sections of society. Thus, fertility decline can set in among these sections first.

Therefore, a desirable level of socioeconomic development is necessary for fertility decline. Since contraceptive use by primigravida indicates a desire to postpone the next child birth, it cannot be related to gender preference, but inevitably, to family size preference. This is also why the majority of acceptors (over 60 per cent) had accepted a permanent method. Sex preference, otherwise derived from the present study is only due to a chance factor, and not based on any deliberate decision making. Therefore, the contraceptive use rate based on the sex combination of children has not been a determinant of sex preference but of family size preference, which has led to a rapid decline in fertility in the State.

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Maternal and paternal aspirations and academic achievement of Xhosa children from broken and intact families

Prof. Varghese I. Cherian

Introduction

A number of studies have yielded a positive relationship between parental aspiration for the education of their children and their academic achievement.[1-4] Factors associated with achievement motivation appear to include parental aspiration.[5] According to Finlayson,[1] parental aspiration contributes to children's achievement. In a Canadian study, Fotheringham and Creal[2] found that parental expectations of children were associated with 19 per cent of the variance in academic achievement, while a Sri Lankan study[6] found that 12 per cent of the variance to be associated with parental aspiration. The effects of marital status on children has become a primary concern of professionals in education and psychology.[7]

While divorce is a positive solution to destructive family functioning, most children experience marital conflict and the often ensuing divorce as a difficult period of transition. Children from unhappy intact homes have more problematic attitudes and lower self-esteem than children from divorced or happy and intact homes.[8] However, life in a divorced home still remains a "high risk" situation for parents and children. Family instability brought about by parental separation, desertion, or divorce affect adversely the academic achievement of children.[9-13] Through the absence of either parent, the child could be deprived of parental help, encouragement and guidance conducive to school work, and this could lessen or nullify the effect of maternal and paternal aspirations for the academic achievement of the children. The purpose of the present investigation was to find out if the relationship between maternal and paternal aspirations and academic achievement of Xhosa children was positive regardless of whether the children were from broken or intact homes in Transkei where 95 per cent of the population comprises Xhosa-speaking people, a sub-group of the Cape Nguni, the southern most representatives of the Bantu-speaking peoples of Africa.

On 26 October 1976, Transkei was granted its republic status by South Africa of which it had hitherto been an integral part for more than 74 years. Among the Transkeians, the

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number of divorces reported over the period 1976 to 1984, and 1984 to 1989 were 2421 and 4015 respectively, and these do not include separations. It would be beneficial to study the effects of this increasing, yet socially stigmatised occurrence of divorce among the Xhosa South Africans. The population of Transkei according to the 1985 population census was 2,876,122.[14]

Sample and Methodology

A stratified random sample of 1021 urban and rural Black Xhosa-speaking children (369 boys and 652 girls) between the ages 13 and 17 (mean age, 15.3 years) was selected from 14,765 boys and 26,109 girls who represented the total standard 7 population in Transkei. The sample included 242 children whose parents were divorced or separated and 713 children whose parents were neither divorced nor separated. The proportion of male and female pupils in the sample was the same as that in the population. General ability scores of the Aptitude Test Battery Standardised for the Xhosa pupils by the Human Sciences Research Council[15] were used to choose pupils of average ability. Pupils who obtained Stanines four to six were selected for the study.

An objective estimate of parental aspiration was based on a questionnaire pertaining to the educational qualifications which the parents wished their children to obtain. The education towards which the parents aspired for their children included University degree, Postsecondary Diploma, Standard 10, and Standard 7 only, and these were grouped into categories 4, 3, 2, 1 respectively. A junior secondary school teacher who taught the children in each of the schools chosen for the study and also lived in the same community as the children, confirmed the parental aspirations perceived by these children to be commensurate with that of their parents. This was established after an interview with the parents and children.

In this study, socioeconomic status was obtained by adding the points awarded to the education, occupation and income of the children's parents. Classification of: Ever been to school, Sub A to Standard 2, Standard 3 to 5, Standard 6 to 8, Standard 8 to 10, Post Secondary Diploma, and University Degree levels of education were awarded points 1, 2, 3, 4, 5, 6 and 7, respectively. Parental income was obtained by dividing the total family income from all sources by the total number of members of the family who shared the income and this was rated on a seven-point scale. Points were awarded in ascending order from the lowest income (1) to the highest income (7). Unskilled manual, Semiskilled manual, Foreman manual, Routine clerical, Supervisory (white collar), Managerial and executive, Professional and high administrative occupational levels were awarded points 1, 2, 3, 4, 5, 6, 7 and 8, respectively to obtain a measure of the parents' occupational status. Parental education, occupation, and income scores were aggregated as the measure of socioeconomic status which was categorised into low, middle and high status.

In developed countries, particularly in the U.S.A., there are specially designed standardised achievement tests to measure the academic performance of pupils. Such tests do not exist in Transkei. The closest measure of academic achievement is the fairly objective national examination administered to all students on completion of Standard 7. The written examination in each subject area comprises multiple choice, short answer, and essay type questions appropriately designed by the internal subject specialists and moderated by external subject specialists. It was in this context that this examination was adopted as a measure of academic performance.

The present study was concerned with pupils who sat for the Standard 7 examination at the end of 1984. The marks obtained by the pupils in seven subject areas, namely, Xhosa, English, Mathematics, General Science, History, Geography, and Agricultural Science collected from the Examination Section of the Transkei Department of Education, were aggregated as the criterion measure. The maximum marks were 400 for the Xhosa examination and 300 for each of the other six subjects.

Results

In the first analysis, shown in Table 1, socioeconomic status of parents and sex of the children from broken and intact homes were controlled. The first group included boys and girls of low socioeconomic status mothers from broken and intact homes.

An analysis of variance indicated no statistically significant relationship between

TABLE 1

Mean achievement scores of boys and girls from broken and intact homes by parental aspirations

Ses	Aspiration scores		Family Status			
			Broken family		Intact family	
			Boys	Girls	Boys	Girls
Father						
low	1	M	892.00	749.32	627.25	728.95
		SD	2.12	46.15	7.47	31.04
		N	9	28	20	55
	2	M		1023.50	1091.00	828.50
		SD		161.93		6.36
		N		2	1	2
Middle	1	M	637.80	906.44	795.94	874.72
		SD	127.98	2.51	15.77	82.18
		N	10	9	17	87
	2	M	942.45	882.65	1041.95	967.80
		SD	17.82	83.76	99.81	93.21
		N	29	86	57	123
	3	M	1107.36	984.29	1082.12	1031.63
		SD	40.85	3.04	25.13	42.17
		N	11	7	52	123
	4	M	1205.75	1085	1221.45	1186.63
		SD	43.68	83.44	54.38	131.47
		N	4	2	11	16
High	1	M			1111.00	
		SD			1	
		N				
	2	M				1498.00
		SD				
		N				1
	3	M	1142.10	1031.58		1125.13
		SD	10.90	4.98		114.16
		N	10	12		79
	4	M	1207.33	1151.70	1259.44	1278.28
		SD	84.99	63.81	99.96	90.35
		N	12	10	45	74

(Contd.)

TABLE 1 ***(Contd.)***
Mean achievement scores of boys and girls from broken and intact homes by parental aspirations

Ses	Aspiration scores		Family Status			
			Broken family		Intact family	
			Boys	Girls	Boys	Girls
Mother						
low	1	M	892.00	749.32	627.00	715.43
		SD	2.12	48.15		67.85
		N	9	28	1	47
	2	M		1023.50	650.45	1002.00
		SD		161.93	103.96	
		N		2	20	1
	4	M				715.50
		SD				0.71
		N				2
Middle	1	M	892.44	852.29	876.67	855.10
		SD	87.63	72.00	79.12	73.49
		N	39	56	36	83
	2	M		935.62	1063.78	977.67
		SD		74.28	127.76	66.96
		N		39	18	159
	3	M	1107.36	984.63	1091.55	1112.92
		SD	40.85	2.97	28.75	63.17
		N	11	8	62	37
	4	M	1205.75	1085	1154.48	1305.88
		SD	43.68	83.44	81.61	185.84
		N	4	2	21	8
High	1	M				1498.00
		SD				
		N				1
	3	M	1150.55	1054.77	1111.00	1159.03
		SD	29.86	83.73		117.73
		N	11	13	1	108
	4	M	1204.82	1131.56	1259.44	1295.62
		SD	88.66	4.00	99.96	99.21
		N	11	9	45	45

mothers' aspirations and academic achievement of their sons in intact homes (F1.19 = 0.05, MSe = 10808.4, $p < 0.8$). The small number of boys from broken homes did not warrant statistical comparison. The academic achievement of girls from intact and broken homes increased as their mothers' aspirations increased. A statistically significant relationship was found for girls from intact and broken homes (F3.63 = 8.10, MSe = 3377.5, $p < .01$).

The second group included boys and girls of middle socioeconomic status. The academic achievement of boys from intact and broken homes increased as their mothers' aspirations increased respectively, as was confirmed by analysis of variance as significant (F4.283 = 127.23, MSe = 5430.3, $p < .01$; F3.101 = 20.7, MSe = 4968.1, $p < .01$).

The third group included boys and girls of high socioeconomic status. No statistically significant relationship was found between the aspirations of mothers and the academic achievement of boys from intact and broken homes (F1.44 = 2.16, MSe = 9991.5, $p < .15$; F1.20 = 3.70, MSe = 4376.4, $p < .07$). The academic achievement of girls from intact and broken homes increased as their maternal aspirations increased and an analysis of variance indicated a positive relationship between maternal aspirations and the academic achievement of girls from intact and broken homes (F2.151 = 25.85, MSe = 12689.7, $p < .01$; F1.20 = 7.44, MSe = 4213.2, $p < .01$). A parity wise analysis of the mean achievement scores supports the above findings arrived at by an analysis of variance between the two variables.

Discussion

The findings show a positive relationship between parental aspirations for the education of children and children's academic achievement regardless of whether the children were from intact or broken homes except in the case of boys from low status broken homes and from high status broken and intact homes. These findings concur with those of Fotheringham and Creal[2], Niles[6], Levine[16] and Cherian.[4]

Parents who do not want their children to seek higher education influence the motivation of their children against the development of talents through higher education. The children of parents with strong aspirations foster behaviour and attitudes such as reading books, studying rather than indulging in other activities and thinking in the long-term rather than short-term, factors which are considered to be conducive to successful school performance.[17] Such behaviour and attitudes are held to be conducive to academic success and parents provide the normative force, and regard these as 'behavioural oughts' for their children.[18] In the face of parental aspirations, children will try to do better, without them they will make little effort. Some children never aspire to do well at school, others for reasons attributable to their home background have levels of aspirations that mobilise direct activity towards such goals.[5]

A single parent is preoccupied with problems of subsistence and sociability, often depressed, and less communicative so providing a stimulating environment for the children is less likely. A broken family has an adverse effect in the academic achievement of Xhosa children.[13] A traumatic personal emotional reaction to loss usually eases somewhat in a few months or years.[19] The intensity of experience of the parents and the children could vary and contribute to variations in parental aspirations, thereby affecting the academic achievement of children from these broken families. The mean achievement of children from broken families tends to be significantly lower than that of children from intact families.[13]

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Traditional birth attendants: Family planning awareness, attitudes and advocacy

Ms. Jaimala Hitesh

Introduction

Traditional birth attendants play a vital role in the delivery of maternal and child health care services in general and midwifery services in particular in the rural areas of the developing world. It is estimated that about 70 per cent of the deliveries in rural areas are conducted by traditional birth attendants.[1] The village folk prefer them to the female health worker because of their easy availability, approachability and the fact that they share their culture and tradition. Recognising that it may take several decades before adequate infrastructure including sufficient numbers of qualified staff is raised to provide essential health and family welfare services to all their people, governments of several developing countries are advocating more effective utilisation of traditional birth attendants.

Considering this, it becomes essential to appreciate the role of traditional birth attendants not only in MCH care but also in promoting family planning. Traditional birth attendants, though untrained and illiterate, have an advantage over trained paramedical staff working at the periphery since they belong to the communities where they live and work. This can have remarkable implications in family planning motivation provided the traditional birth attendants themselves have a favourable attitude to family planning and are equipped with the right knowledge.

Against this background, traditional birth attendants in Rajasthan were studied in order to determine their awareness of and attitudes to various methods of family planning, and the implications in relation to the family planning programme.

One hundred and seventy-five traditional birth attendants were identified for the study from Dausa district of Rajasthan where a MCH project of the Indian Council of Medical Research (ICMR) was being implemented by the Indian Institute of Health Management Research, Jaipur during 1991-93. Two field investigators with a background of sociology were assigned the task of interviewing the traditional birth attendants. Their knowledge of and attitude to family planning was assessed by interviewing them with the help of a simple pretested questionnaire, while advocacy or promotion of family planning by them was determined by

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interviewing the Auxiliary Nurse Midwives (ANMs) and Male Paramedical Workers (MPWs) of the concerned area.

The traditional birth attendants had been trained by the same team of field investigators with regard to MCH and midwifery services; thus the close association between them facilitated the interviews eliciting their knowledge of and attitudes to family planning. Each interview lasted for about 30 minutes. The first five minutes were utilised for collecting general information such as the name, age, educational level, marital status, occupation and midwifery experience etc. together with some informal talk about the respondent's family, health and so on. The remaining time was devoted to assessing their knowledge of and attitudes to the various family planning methods. Most of the conversation was in the local dialect.

Results and Discussion

The majority (83 per cent) of the traditional birth attendants were above 40 years of age and had five children on an average. Almost all (98 per cent) of them were completely illiterate; the remaining two per cent had attained primary education only. Likewise, the vast majority (96-97 per cent) came from lower caste families and the low economic class. Economic status was assessed by using the Quality of Life Index[2] (See Annexure).

Table 1 presents the awareness of the traditrional birth attendants to the different available methods of family planning.

TABLE 1

Distribution of traditional birth attendants by awareness of family planning methods*

Method	Respondents (N - 175)	
	Aware	Not aware
Male sterilisation	135 (77.1)	40 (22.9)
Female sterilisation	175 (100.0)	-
IUD (Copper-T)	113 (64.6)	62 (35.4)
Oral pill	148 (84.6)	27 (15.4)
Condom (Nirodh)	98 (56.0)	77 (44.0)
Natural FP	3 (1.7)	172 (98.3)
Others	8 (4.6)	167 (95.4)

* multiple answers

It was surprising to note that almost a quarter (23 per cent) of the traditional birth attendants were unaware of male sterilisation. It came rather as a shock to them that a man could be made to suffer to prevent childbirth. According to them only women were to be responsible for fertility and especially for the lack of it. Similarly, awareness of the condom or the condom as a contraceptive method was found to be quite low (56 per cent). Interestingly, they considered the IUD - Copper-T - as a "three-year injection".

Attitudes to FP

Table 2 presents the attitudes of the traditional birth attendants to available methods of family planning. It shows that those who were aware of male sterilisation were largely against it as they thought that it would make the man impotent. When asked to elaborate on this, they expressed the fear that the man may not be able to control his wife as the operation would reduce his "male power" and thus lower her/society's respect for him. Another very important reason for not favouring male sterilisation was that the man would not be able to remarry if his wife died or separated from him.

Female sterilisation was equally rejected on the ground that it causes a number of physical problems such as excessive bleeding, stomachache, weakness etc. Another concern was that the woman would not be able to get pregnant again in the event of her child or children meeting with an accidental death.

The rejection of the IUD and other temporary methods of family planning was comparatively low. It is important to note that not even a single traditional birth attendant could cite better food, clothing and education as an advantage of having a small family as was revealed in a study[3] conducted in Ambala district inspite of the fact that traditional birth attendants from both the districts had similar socioeconomic and educational characteristics.

Promotion of FP

We also tried to find out whether the traditional birth attendants advocated the use of various family planning methods as reflected by the responses of ANMs and MPWs working in the areas where these traditional birth attendants lived. Table 3 presents these findings.

Table 3 indicates that inspite of having a positive attitude to the IUD and condom, the promotion of these methods by the traditional birth attendants was comparatively very low. The condom was mainly distributed through the wives of eligible users. Also, vasectomy was not at all advocated, the reasons, as mentioned earlier, being sociocultural.

Conclusion and Recommendations

Traditional birth attendants constitute one of the grossly underutilised primary health care manpower resource especially in the field of family planning.[4] They can be very important link persons between the community and health functionaries and can be effectively utilised for disseminating awareness and educating the community about various desirable health and family planning

TABLE 2
Distribution of respondents by attitude to different family planning methods

Method	Number of traditional birth attendants *					
	Positive attitude		Reasons for positive attitude	Negative attitude		Reasons for negative attitude
	No.	%		No.	%	
Male sterilisation	4	3	Men can afford to rest, men are stronger	131	97	Causes impotency, heavy work can't be done, can't remarry
Female Sterilisation	27	15	She can get rid of suffering again and again	148	85	Causes stomachache, bleeding, backache can't conceive again if children die
IUD (Copper-T)	75	66	Can be removed if child is wanted	38	34	Causes stomachache, bleeding, backache
Condom	57	58	Causes no pain to either spouse; no side effects	41	42	Causes awkwardness if found by others, men don't like to use it
Oral pill	112	77	Can be used without letting the husband know about it	36	23	Weakness, nausea, headache, white discharge, weight gain
Natural FP	3	100				

* N varies for different methods; refer Table 1

TABLE 3
Distribution of traditional births attendants* by advocacy of family planning methods

Method	Advocated	Did not advocate
Male sterilisation	0	0
Female sterilisation	12	7
IUD (Copper-T)	3	2
Oral pill	16	9
Condom	9	5
Natural FP	3	100

* N varies for different methods; refer Table 1

practices. It is therefore important to train them so as to clear their doubts and misconceptions about different family planning methods.

Our study reveals that the knowledge of traditional birth attendants about male contraception, whether temporary or permanent, was quite low. Their attitude to family planning in general, as also to the different methods of family planning, was quite unfavourable. While various reasons were advanced for their positive or negative attitudes, an unspoken fact for not favouring family planning could be the economical loss associated with advocating it. The family planning movement has in a way caused a great setback to their profession. Compared to the days when a woman, on an average, delivered eight to ten children, today a woman prefers only two to three children. Further, when a terminal method is favoured, the last child is usually born in a hospital as the tubectomy is performed postpartum. This obviously means a loss of income for the traditional birth attendant, and could perhaps have been the most crucial factor responsible for their negative attitude to family planning, and consequently their low motivation to advocate it.

There is a need to change the attitude of traditional birth attendants by creating an awareness among them of the benefits of family planning and removing their misconceptions about the use of contraceptives. Some steps have to be taken to motivate as well as strengthen the position of traditional birth attendants like formally absorbing them in the health system, fixing an honorarium for them etc. These interventions will not only facilitate the process of training and monitoring their participation in the programme but will motivate them to contribute towards meeting the health needs of their communities as their economic needs will be satisfied.

ANNEXURE

Quality of life index (QOL)

Assets	Value given
One year's grain stock available	3
Land (10 bighas or more)	2
One month's grain stock available	1.5
Buffaloes/Cows	1
Truck/Tractor	1
TV/VCR	0.5
Scooter/Motor Cycle	0.5
Radio/Transistor	0.2
Cooler/Fan	0.2
Gas/Stove	0.1
Next days grain stock not available	0
	10

Interpretation:

QOL Index	*Range*
Good	10-6
Average	5-3
Poor	2-0

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Implications of contraceptive practice on future fertility trends in Bangladesh

Dr. Samad Abedin and Dr. M. Nurul Islam

Introduction

Like many other developing countries, Bangladesh emphasises the importance of reducing fertility as a part of its overall strategy to bring down the growth rate of the population. Family planning programmes are ongoing in the country to help achieve its demographic goals. These goals which are synchronised with economic developmental goals, are usually achieved through targets set for each family planning method.

Unfortunately, there has always been a gap between the fertility goal (total fertility rate or TFR) and its achievement at the terminal year of all plan periods. The country has never gained either the desired level of fertility or the contraceptive prevalence rate (CPR) aimed at achieving the desired fertility. For example, during the plan period 1980-85, against a fertility (TFR) goal/target of 4.1 children per woman and a CPR goal of 38 per cent, the achievement was a TFR of 5.55 and a CPR of 25 per cent. During 1985-90 too, there was a similar gap between the goals and the actual levels of achievement. Such gaps have led to the questioning of the procedure used to project CPR in order to achieve the desired TFR (at the end of a plan period). This article aims at estimating the TFR for a given level of CPR, and estimating the CPR to achieve the targeted fertility (TFR), without taking account of the trends in a few proximate determinants of fertility.

Analytical methods

The estimation of TFR for a given level of CPR was made by fitting a regression equation of the form -

$$\text{TFR} = \alpha + \beta\,\text{CPR} + \varepsilon$$

where TFR is the total fertility rate, CPR is the contraceptive prevalence rate; and ε, the error term. The linear regression suggests that, *ceteris paribus*, the maximum fertility (in terms of TFR) that can be attained by a population is 'α' in the absence of contraception, and that the introduction of contraception arrests fertility from reaching its maximum level by an amount which is 'β' times the extent of the prevalence of contraception.

Estimates of 'α' and 'β' were made by the method of least squares using cross-sectional or longitudinal data of TFR and CPR. The practice of fitting a regression equation to the data of TFR and CPR of which TFR is a

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dependent variable is not a new one. Bongaarts[1,2] has examined the strength of the relationship between TFR and CPR by fitting a regression of TFR on CPR for 83 countries[1], and subsequently, for 74 populations.[2] In this paper, fitting was accomplished using biennial longitudinal data of TFR and CPR from 1979 to 1984 for Bangladesh.

Projection of CPR for attaining a specified level of fertility was done by using Bongaarts' target-setting model.[3] This model is derived from Bongaarts[4] original multiplicative model which relates TFR with the major proximate determinants of fertility, and is given by

$$TFR = Cm \times Cc \times Ca \times Ci \times TF$$

where, C_m, C_c, C_a and C_i are the indices of marriage, contraception, induced abortion and lactational infecundability respectively and TF, the total fecundity rate. Each of the four indices varies from 0 to 1. The model can be applied for target setting as done by Bongaarts[1] for the target year 't' with respect to the base year '0', that is -

$$\frac{TFR(t)}{TFR(o)} = \frac{Cm(t) x Cc(t) x Ca(t) x Ci(t) x TF(t)}{Cm(0) x Cc(0) x Ca(0) x Ci(0) x TF(0)}$$

The above equation indicates that a reduction in fertility from TFR(0) to the target level TFR(t) depends on the trends in the indices of all the proximate variables. The base year may be the present or some recent year. Under the assumption of no change in total fecundity, the absence of or a negligible effect of induced abortion and trends in the indices of Cm and Ci compensate each other, and the equation reduces to the form -

$$\frac{TFR(t)}{TFR(0)} = \frac{Cc(t)}{Cc(0)}$$

$$\text{or } 1 - \frac{TFR(t)}{TFR(0)} = 1 - \frac{Cc(t)}{Cc(0)}$$

$$\text{i.e. } \frac{TFR(0) - TFR(t)}{TFR(0)} = \frac{Cc(0) \quad Cc(t)}{Cc(0)}$$

$$\frac{Cc(t) \quad Cc(0)}{Ce(0)}$$

The above expression indicates that the proportional reduction in fertility (PRF) between '0' and 't' depends on the proportional increase in the CPR from '0' to 't' (on the assumption that with time, contraceptive prevalence will increase).

Since Cc = 1-1.08u x e where, u = contraceptive prevalence rate, and e = effectiveness of contraception,

$$1 - \frac{TFR(t)}{TFR(0)} = 1 - \frac{Cc(t)}{Cc(0)} -$$

$$1 - \frac{1 - 1.08 x u(t) x e(t)}{1 - 1.08 x u(0) x e(0)} = PRF$$

Here, u(t) is the CPR among married women of reproductive age at the beginning of the plan year 't'. Rearranging the above equation, we get -

$$u(t) = \frac{1 \quad (1 - PRF) x (1 - 1.08 x u(0) x e(0)}{1.08 x e(t)}$$

The input data required for the estimation of u(t), are $PFR = \frac{TFR(0) - TFR(t)}{TFR(0)}$, u(0) - the CPR of the base year and e(t) - TFR(0) the use effectiveness of contraception of the current year.

Trends in fertility and contraceptive prevalence were estimated by fitting the regression line and incorporating the target-setting model for Bangladesh. The study uses data from the Bangladesh Contraceptive Prevalence Surveys of 1979, 1983 and 1985, the Bangladesh Fertility Survey of 1989[5], and the Vital Registration System of Bangladesh, 1987.[6] These surveys cover a nationwide representative sample and the data are taken to be of reasonably good quality.

Results and Discussion

The actual contraceptive prevalence rates and the total fertility rates for Bangladesh from 1979 to 1983, given biennially, are shown in Table 1.

The regression of TFR on CPR from this longitudinal data yielded a regression of

TABLE 1
Observed TFR and CPR, 1979-89 and excess fertility

Year	TFR	CPR	Effectiveness	Excess TFR
1979	6.56	12.7	0.812	- 0.3400
1981	7.03	18.6	0.786	+ 0.7750
1983	6.08	19.1	0.839	- 0.1125
1985	5.55	25.3	0.845	+ 0.1325
1987	4.42	29.6	-	- 0.4600
1989	4.90	30.8	0.849	- 0.1700

Excess TFR = TFR - TFR
TFR = 8.58 - 0.125 CPR
r = 0.877; s^2 = 0.20387; "-" not available.
Source: Huq and Cleland[5]; BFS[6]; and Kabir and Rab[7]

TFR= 8.58 - 0.125 CPR with a Pearson's coefficient (r) of 0.877 and a residual variance, $s^2 = 0.26387$. The degree of correlation was high (r= 0.877) and significant (at a five per cent level of significance). The temporal variation in fertility explained by CPR alone was nearly 77 per cent; the remaining 23 per cent may be attributed to the effect of other proximate variables. Deviations from the regression line (excess fertility) were due partly to measurement errors and partly to variations in the other proximate determinants of which marriage is an important variable.

According to the regression equation, the TFR equals on average 8.6 births per woman in the absence of contraception (CPR=0), and fertility declines at a rate of about 1.2 births per woman for each 10 per cent increment in the CPR. Under such a relationship between TFR and CPR, the replacement level of fertility would require a contraceptive prevalence level of around 52 per cent. At the pace at which contraceptive practice is progressing, such a replacement level of fertility can be achieved around the year 2000 (assuming a linear relationship between time and CPR). The regression equation suggests that a TFR of 3.5 births per woman can be achieved by the year 1995 if the level of CPR is raised to about 41 per cent in that year. At the pace at which contraceptive practice has progressed since 1979, it is not impossible to attain a CPR of 52 per cent at the end of this century. The declining pattern of fertility with time also suggests that, *ceteris paribus*, Bangladesh may achieve a fertility level of 2.0 births per woman at the beginning of the next century.

Table 2 gives the contraceptive prevalence rates required to reach different fertility targets within the stipulated time periods. These rates were computed using

TABLE 2
Estimated contraceptive prevalence levels required to achieve fertility target with given level of contraceptive effectiveness relative to base year 1989
(In 1989, TFR = 4.895; CPR = 0.308; e = 0.849)

Time period (Year)	Target TFR	PRF	Required CPR to achieve TFR with contraceptive effectiveness e(t) of		Reduction in TFR from 1989	Increase (in CPR) from 1989 given *e(t) of*	
			0.85	0.90		0.85	0.90
1990	4.5	0.0807	0.371	0.350	0.395	6.3	4.2
	4.0	0.1828	0.451	0.426	0.895	14.3	11.8
	3.5	0.2850	0.530	0.501	1.395	22.2	19.3
	3.0	0.3871	0.610	0.576	1.895	30.2	26.8
	2.5	0.4893	0.690	0.652	2.395	38.2	34.4
2000	2.0	0.5914	0.770	0.727	2.895	46.2	41.9

Bongaarts' target-setting model taking 1989 as the base year when TFR was 4.895 and the contraceptive prevalence and effectiveness, 0.308 and 0.849 respectively.[5] The CPRs were computed at a use effectiveness of 0.85 and 0.90 (since effectiveness of contraception had already reached 0.849 in 1989). The findings suggest that if a TFR of 4.50 is to be achieved in 1990, the level of CPR with 0.85 contraceptive effectiveness has to be raised to around 37 per cent while at a contraceptive effectiveness of 0.90, the CPR would have to be about 35 per cent. Further, a TFR of 3.0 can be achieved in or nearabout 1995 by raising the CPR to approximately 61 and 58 per cents at a contraceptive effectiveness of 0.85 and 0.90 respectively to achieve a target fertility of around 2.0 in the year 2000.

When the year previous to the current year is taken as the base year, the target-setting model estimates CPRs very close to the observed levels for the years 1985 and 1987 but shows a slight variation between the two values for the year 1989. According to the model estimate, the CPR should be around 36 per cent in 1989 instead of 30.8 per cent as observed for a TFR of 4.90. On the other hand, if the observed CPR is true then the model estimate of TFR should be 4.6 births per woman instead of 4.9 births, a reduction of 0.3 births per woman. For the observed CPR of 25.3, 29.6 and 30.8 per cents corresponding to the years 1985, 1987 and 1989 the estimated CPR are 26.2, 29.0 and 35.5 percents respectively for the TFR of 5.55, 5.30 and 4.90. Conversely, taking the observed CPR to be true the model estimates TFR of 5.55, 5.27 and 4.62 births per woman respectively corresponding to the years of 1985, 1987 and 1989.

If we take 1989 to be the base year and if we desire to achieve the replacement level of fertility by the year 2000 then according to model estimate we have to attain a contraceptive level of around 75 per cent with effectiveness of 0.85 and 71 per cent with effectiveness of 0.90 an increase of nearly 42 and 40 per cents respectively relative to the base year which is though highly ambitions but perhaps not a far reaching target at least in view of present context of contraceptive use in Bangladesh.

Conclusion

The estimates of CPR to achieve certain level of fertility at a stipulated time using two models viz. linear regression and Bongaarts' target setting models are found to be inconsistent for obvious reasons. Apart from methodological differences the estimate of CPR using linear regression model is based completely on the face values of TFR and CPR and takes account of the trends of both the factors while the estimate made by Bongaarts' target setting model heavily depends only on the level of contraceptive use of the most recent year and ignores the effects of other two important proximate variables of marriage pattern and lactational infecundability. There seems to be a change in marriage pattern in the country and also exists a norm of long durations of breastfeeding practice - the effects of which cannot be ignored to achieve a target fertility. A high degree of correlation between TFR and CPR bears the implication that it is possible to achieve a replacement level of fertility around the year 2000 if the present pace of progress in contraceptive practice is maintained. However, the estimation requires more sophisticated techniques.

Now-a-days quite a few computerised target setting model like TABRAP, CONVERSE, PROJTARG are available. These schemes are however, of great variation in form, sophistication and data utilisation and none of these existing models is perfectly suited for application due to lack of detailed input data. In this respect Bongaarts' target setting model is easy to handle. Nevertheless, national planners should search for such an analytical model coherent with the present situation of the country which can be used to project CPR in order to achieve the desired level of fertility within the stipulated time.

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Dimensions of status of women in developing countries

Dr. Alok Chaurasia

Introduction

History informs us that once upon a time a matrilineal form of society characterised the world. Women, in that society, enjoyed many privileges - autonomy, equality or even superiority, dignity, property rights etc. Today, there are only a few traces of this form of society in the world, and the patrilineal form dominates the world - a society in which privileges are the property of men, and women are generally regarded as second class citizens.

One does not know the exact reason for this drift away from matrilineal form to the patrilineal form. It is basically a matter of historical sociology but is equally important in the context of women's position in society. However, one can readily visualise a continued lowering of the place of woman in modern society. This lowering has been associated with an ascendancy in the powers and privileges of men. In today's social and economic order, there appears to be a built-in bias for men that is translated into varying degrees of prejudice against women. Most interestingly, this bias is invariant of the level of income and the prosperity of nations. A study carried out by the United Nations[1] states that women who constitute nearly half of the world's population and nearly one-third of the labour force, put in nearly two-thirds of work hours but receive only a tenth of the world's income and own only one-hundredth of the world's property.

Although the exploitation of, and discrimination against women are global phenomena, their consequences are particularly tragic in third world countries. Poverty, ignorance, deprivation of the basic necessities of life, and new pressures of transition from the traditional to a modern form of society combine to aggravate the inequality among sexes in these countries to a point where the very existence of woman is reduced to a continuous battle for survival.

Of late, there have been some serious efforts to improve the status of women in third world countries, mainly in the context of rapid population increase in these countries after the second world war. Among the various approaches suggested to control this rapid population growth, one is the improvement in the status of women within the family as well as in the society.[2] It has been hypothesised that an increased status of

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women in the society as well as within the family may help her to think objectively and act rationally particularly in matters relating to reproductive behaviour. It is in this context that the year 1975 was declared as International Women's Year and the decade 1975-85 as the International Women's Decade by the United Nations. All these initiatives have led to legislative reforms and ameliorative actions in various countries of the world. But still, women in nearly all countries of the world lag far behind men as far as their status in society and within the family is concerned.

This paper, primarily, has a structural orientation. Utilising information on the experiences faced by women in typical third world settings, it attempts to identify the major and minor dimensions that decide the place of woman in society in different social, economic and cultural settings. Such an exercise may be helpful in suggesting an optimal line of action for improving the status of woman. Currently, very little attention has been paid to the analysis of the structural dimensions of the status of woman in society. Measurements of women's status have been guided, often heavily, by information available as well as by the individual choices of the researcher.

The present analysis is based upon two basic premises. The first assumes that the status of woman in society should be studied as a multiple whole within the society by taking into consideration the interactions that take place in various aspects of life and not in a unidimensional way as has been the practice so far. The second premise is that the different facets of life may have differing impacts on the status of woman in different socio-political settings. As such, all the facets of life should not be given equal importance in measuring the status of woman. Current research on women's status has paid practically no attention to the relative importance of various facets of life as well as those of society. All these facets have been assigned equal weights presumably because very little information is available. A more troubling problem is that these weights are not universal - that they may vary from society to society. But ignoring them may conceal the actual situation.

Data Source

The analysis is built upon the data provided by the Population Crisis Committee on the status of women in 99 developing countries of the world.* These data are related to 15 variables grouped into five categories of health, marriage and children, education, employment, and social security as given in Table 1. The data are in the normalised form. The normalisation procedure is based on a five-point scale with a maximum level of five indicating the highest status. The details of the normalisation procedure as well of the limitations of the data which normally belong to the period 1973-86 may be found in the report prepared by the Committee.

The analysis has been restricted to third world countries primarily because the problems or the hazards faced by women in these countries are entirely different both in nature as well as in magnitude from those faced by women in developed countries. As such, a mixing of the groups is supposed to be of little use in any empirical analysis. The in-

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* For a discussion on the various aspects of factor analysis, the reader may refer to *Multivariate Data Analysis* by Cooley W.R. and Lohnes P.R., John Wiley and Sons, New York, 1971. Usually, such calculations are tedious and are carried out with the help of computers. Many standard statistical software packages are now available which give factor analysis solutions. One such is the Statistical Package for Social Sciences (SPSS).

TABLE 1
Variables used in the analysis

Category	Variables
A. Health	1. Infant and child mortality (V1) 2. Mortality in the childbearing years (V2) 3. Expectation of life at birth (V3)
B. Marriage and children	1. Teen marriage rate (V4) 2. Total fertility rate (V5) 3. Contraceptive prevalence (V6)
C. Education	1. Proportion of female secondary school teachers (V7) 2. Primary/Secondry school enrolment ratio (V8) 3. University female enrolment ratio (V9)
D. Employment	1. Self-employment ratio (V10) 2. Proportion of females in paid employment (V11) 3. Proportion of professional females (V12)
E. Social equality	1. Economic equality (V13) 2. Political and legal equality (V14) 3. Equality in the marriage and the family (V15)

formation available through the Population Crisis Committee relates to 71 countries of the third world - 22 from Africa, 25 from Asia and 24 from Latin America. However, the present analysis is based on only 44 countries as information on one or more variables was missing in the original data set of the rest of the countries.

The method

The factor analysis technique was applied to the data set of 15 variables from 44 countries of the third world to identify the major and minor dimensions that determine the status of women in a country. Essentially, factor analysis organises the interacting variables into groups in such a way that the correlation between the variables of the same group is maximum while the correlation between the variables of different groups is minimum. These groups of variables may then be taken as the dimensions. In other words, factor analysis consists of factorising the variable set into variable sub-sets in such a way that these sub-sets are mutually independent of each other in the stochastic sense.

The details of the factor analysis technique including the different criteria used in extracting factors and the interpretation of factors along with the rotation of factors so as to make them more interpretable etc. may be found in any advanced text book on multivariate statistical analysis.[3] Here, we have used the principal component method of extracting the initial factors followed by the varimax criterion for the rotation of factors. The principal component method extracts factors according to the amount of total variation accounted by the factor. Thus, the factor which is responsible for maximum variation in the data set is extracted first and then the factor which accounts for the next maximum variance. On the other hand, the varimax criterion maximises the variance within each of the factors so extracted.

The Dimensions of Status of Woman

The application of the principal component method generated three factors which accounted for 71.4 per cent of the total variation in the data set, indicating that the factors generated by this method described the variation in the data set in a satisfactory manner. In order to obtain better interpretable factors, the varimax criterion was applied. As there was no improvement, the initial factor solution was retained for discussion and interpretation. It may be noted that the proportion of total variance explained by a particular factor is not altered by the rotation of factors. Variables with significant loadings in different factors are compiled in Table 2.

Table 2 shows that the first factor has consistently high loadings for variables that fall in the categories of health, marriage and

TABLE 2
The three dimensions of women's status in developing countries

Common	Specific Dimensions	
I	II	III
Infant and child mortality (.92)	Economic equality (.62)	Female self-employment ratio (.67)
Mortality in child-bearing years (.91)	Political and legal equality (.74)	Proportion of females working as professionals (.57)
Expectation of life at birth (.95)	Equality of marriage and family (.58)	
Teen marriage rate (.76)		
Total fertility rate (.76)		
Contraceptive prevalence (.87)		
Proportion of female secondary school teachers (.77)		
Primary/Secondary school enrolment ratio (.86)		
University female enrolment ratio (.61)		
Proportion of females in paid employment (.77)		

children, and education. In addition, the loading of the proportion of women in paid employment was also very high in this factor which accounts for nearly 51 per cent of the total variation in the data set. Thus, a major dimension of the status of women in third world countries may be seen in their health and reproductive levels, and their educational and employment status. This dimension may be termed as the common dimension and appears to operate across all countries included in the analysis irrespective of the nature of the society, forms of government, and levels of social and economic development.

The second factor, on the other hand, has high loadings in variables of equality only. This factor accounts for about 11 per cent of the total variance of the data set. Similarly, the third factor has high loadings only in self-employment and in the proportion of women working as professionals. This factor accounts for about 8 per cent of the total variation in the data set. These factors may be classified as the specific dimensions of the status of women in a typical social setting and they, in aggregate, account for nearly 20 per cent of the total variation in the data set.

Thus, our analysis suggests that nearly three-fourths of the variation in women's status across the countries of the third world may be explained by three dimensions - one common and two specific. The common dimension which appears to operate in all countries irrespective of the socio-cultural setting, economic development, and the form of government may be seen as composed of the health and educational status of women, her reproductive behaviour, and her share in paid employment. The major variation in women's status across countries of the third world may be seen in the variations in these sub-dimensions which co-vary across countries as well as at different levels of development.

In addition to this common dimension, there are two other specific dimensions. These dimensions are specific in the sense that they act independently of the common dimension of woman's status. The first is the dimension of equality while the other may be classified as the dimension of social and economic independence from man. It may be pointed out here that paid employment alone may not provide a woman social and economic independence from man particularly when the wage rate is low as is the case in most of the developing countries. These dimensions may not account for a major share of the variation in the data set but they definitely play a dominating role in deciding a woman's status. More importantly, if improvements in health, education and employment - the constituents of the common dimension - do not lead to the social equality and economic independence of woman, than they may not lead to an improvement in the status of woman after a certain extent.

The analysis highlights the role of social equality and economic independence of woman in improving her status either in the family or in society. This observation is not new and has been often repeated. But the important point is that a woman's social equality and economic independence may not be achieved by pursuing the policy of economic development alone as is the case with most of the developing countries today. Our analysis shows that both social equality and economic independence act independently of the common dimension which is directly related to economic development. This means that economic independence of a woman and her equal status with man is not linked with the level of economic development of the community as is generally hypothesised. Rather, they act independently and may well have their own causative factors and determinants.

This observation has been supported by a number of studies carried out in developing countries which conclude that the current wave of economic development and related westernised modernisation has adversely affected women in traditional societies.[4] There are studies which support the findings of the present analysis and contradict the widely prevalent notion that westernisation and related modernisation promote the liberation of women.[5-7] These studies highlight the favorable position of women in traditional societies and describe how western values in the colonial period and the westernised model of modernisation have damaged the status of women. The vast literature available on the subject suggests that, on the whole, women in developing societies rarely stand to gain in the modernisation of their economies. Rather, they may suffer new inequalities and indignities as their economies develop.

Recognising the fact that modernisation does not necessarily bring out freedom and equality in the personal life and status of women, nearly all the developing countries have, during the last three decades, introduced major legislative reforms aimed at equalising the personal status of men and women. But putting these laws into actual practice has been quite problematic mainly because tradition and custom continue to exert a strong influence on the behaviour of men and women.[8] In fact, legislation alone cannot change society as the Committee on the Status of Woman in India points out.[9] There are other studies in India which also indicate that there is a yawning gap between the newly instituted rights and freedom legally available to women with respect to marriage, inheritance, divorce and adoption and the actual situation.[10] Finally, there are studies which suggest that even these legalisations in many countries are insufficient to ensure equality for women as compared to men.

Limitations of legalisation are very much evident when we discuss the political equality of women. There are very few countries today (most of them orthodox Muslim sultanates) where women have constitutionally been deprived of the right of franchise. However, this near universal recognition of women's political rights and the strength of their voting numbers are nowhere reflected in their direct role either in the political process or in the government. In India, the largest democracy in the world, for example, women constituted and still constitute only an insignificant proportion of the representatives of the legislature either at the State or at the national level. Recently, rather in desperation, the Indian government has reserved seats for women in local bodies. But this has led to the phenomenon of dummy participation in which pure counting of numbers may give a higher proportion of women representatives but, in practice, only a few of them are functioning independent of men.

The participation of women in the labour force has widely been recognised as an essential condition for improving women's status. However, our analysis shows that paid employment is only a part of the common dimension of the status of woman. It is economic independence which acts specifically in deciding the status of a woman in society. Often, in developing countries, participation in the labour force alone may not ensure economic independence for women simply because of limited employment opportunities and low wage rates as compared to men. In fact, it is not paid employment but the involvement of women in the self-employment sector or in the professional, highly-paid sector which acts specifically in deciding thier position in society. This observation casts doubts on existing government policies of universalising school education for girls and creating employment opportunities in the service sector alone for improving the status of women. Such an attempt may be helpful in raising the income levels within the family leading to a better nutritional status of the woman but, specifically, she will continue to depend upon man and will continue to be guided by his motives and interests. Today, women in developing countries constitute only a small percentage of the total professional labour force. This may be one of the specific factors, as our analysis shows, for the low status of women as professional attainments, usually associated with higher income and education, are generally linked with status symbols in any society of the world.

It is possible to apply the above findings in discussing the status of woman in the countries included in the study sample. This requires the construction of indices for each of the three dimensions of women's status for each country separately. One simple way of constructing these indices is to take the weighted average of the variables in each dimension with factor loading of each variable as weight. We have applied the above procedure for each of the 44 countries included in the study sample and calculated the three indices for each of the 44 countries. A summary of these indices has been presented in Table 3. Since the scale of all the three dimensions is same, it is possible to make a relative comparison of the different dimensions, and likewise to compare different countries with reference to the three dimensions.

Table 3 indicates that the common dimension of women's status that varies widely across countries. This is expected as this dimension appears to be sensitive to the level of social and economic development which varies across the countries included in the study sample. In fact, the areas of health, family welfare, general education, employment, etc. have been the areas of intensive intervention in most of the developing countries in the context of the development strategies they have adopted. These interventions have been successful in changing existing health and family welfare, general education and employment level indicators, often significantly - a fact which has been well reflected by the summary measures presented in Table 3.

TABLE 3

Summary measures of the indices of dimensions of status of women in developing countries

Summary measure	Dimensions		
	I	II	III
1. Arithmetic mean	2.142	1.582	0.542
2. Standard Deviation	0.766	0.154	0.193
3. Tukey's Summary Measures			
i. Minimum	0.068	0.323	0.310
ii. Lower quartile	1.467	1.297	0.310
iii. Median	2.158	1.667	0.393
iv. Upper quartile	2.727	1.953	0.477
v. Maximum	3.485	2.553	1.817
4. Skewness (Bowley)	- 0.097	- 0.128	0.503

Moreover, the countries included in the study sample are distributed almost symmetrically over the scale of the index as is clear from the summary measures as well as from the fact that there is very little difference between the arithmetic mean and median values, and that Bowley's measure of skewness is very close to zero. Also, the estimation of Tukey's summary measures and related analysis do not reveal any outliers in the study sample.

The pattern across countries in the second dimension - the specific dimension of social equality - is more or less similar to the common dimension. However, on average, this dimension has a lower value than the common one. The distribution of countries in this dimension is also nearly symmetrical. Thus though, the dimension of social equality has a comparably lower value than that of the common dimension, both of these dimensions vary in a similar manner across countries. By contrast, variations in the third dimension - the dimension related to the social and economic independence of woman - across countries has been found to be entirely different. Not only does the index of this dimension, on average, have a very low value, but its distribution is highly skewed as may be seen from a very large difference between the arithmetic mean and median as well as from the value of Bowley's measure of skewness. Most interestingly, almost half of the countries in the sample were found to have the minimum value of the index. This shows, once again, that improvements in the common dimension of a woman's status may not necessarily lead to improvements in the specific dimensions of her social and economic independence. Improvements in terms of the level of living through an increase in income levels via economic development may improve the health and nutritional levels of women, may raise their educational standards and may provide enhanced employment opportunities, but all these changes may contribute to only one dimension of the status of women - the common dimension and not to its specific dimensions.

Thus, of the three dimensions of women's status identified in this analysis, the pattern of variation across developing countries has been found to be more or less similar with respect to two dimensions - one common and one specific - but the third dimension has an entirely different pattern. This difference is not only in the levels achieved on the measurement scale which happens to be uniform for all the three dimensions but also in terms of the skewness of the distribution of countries on this scale. In the two dimensions that behave in a similar manner, the skewness is almost negligible but in the third dimension, it has a very high positive value. This indicates that the progress in the two dimensions that behave in a similar manner is not reflected in the third dimension, again supporting the view that improvements in the level of living through economic development and legalisation of the rights of women may not be enough to make a woman independent of man in social and economic terms.

An interesting observation of the previous analysis is the presence of outliers in the dimension of social and economic independence of women. There are eight such countries and all of them have a very high index of this dimension indicating that women in these countries are comparatively more independent in social and economic terms as compared to those in other countries of the study sample. Interestingly, except for one or two countries, all the countries of this group are at a low level of economic development. Clearly, low economic development is not a barrier for women in enjoying a type of social and economic independence in relation to men within the family as well as in society.

Conclusion

The analysis brings out in sufficient detail the complexities in dimensioning the status of women in the developing countries. It shows that variations in their status may be seen through the dimensions of improvements in the level of living, social equality and economic independence. An important conclusion of the analysis is that the three dimensions are independent of each other suggesting that improvements in the levels of living via economic development may not lead either to economic independence or social equality of women as is widely expected and has been hypothesised. In fact, variations in the level of living in different countries explain only half of the total variation in the status of women, while specific dimensions, of which social equality and economic independence are the major aspects, account for the remaining half of the variation. If this is so, then emphasising only upon improvements in levels of living through economic development, insisting upon universalisation of female school education, and creating non-professional employment for women may not help much in giving women their long overdue status in society. Our findings thus suggest that despite economic development and legislation on women's rights, women in most developing countries continue to depend upon men both from the social as well as economic points of view, and are guided by men's motives and interests in their daily lives.

What then are the options for the developing countries, the so-called poor countries of the world? The first major issue, it appears, is that they should not be motivated and guided by the glamour of the affluent western society. The need of the time is that they should review their own society and traditional systems in a rational manner independent of the western bias. A micro analysis of the traditional society in the context of the place of women in the family as well as in society will be of great help in this process of analysis. Only after a successful completion of such a review would it be possible to identify specific points of intervention that may help improve the status of women. Unfortunately, such a review process has rarely been carried out in developing countries and we depend, almost totally, on western thinking in the conceptualisation of issues related to the status of women.

Another important issue in measuring the status of women in a particular country or society is the level of research or analysis. Most of the research on the status of women has primarily been confined to the macro-level. Hardly any attempt has been made to analyse the place of a woman within the family. But it is the family that constitutes the society or the community. As such, the status of a woman in the society or in a community is nothing but a direct aggregation of the status of women within the family. At present, very little is known about how the status of women varies in different family forms when their education and employment levels are controlled. Similarly, it is not known, how the status of the women within similar types of family forms varies with variations in the level of education and employment. Such analyses are essential for understanding the complexities of the dimensions which contribute to the status of women.

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An assessment of maternal mortality and its causes - A demonstration project in Tamilnadu State

Dr. L. Ramchandran and Mr. P. Muthuswamy

Introduction

The importance of vital statistics for planning, monitoring and evaluation of a health service programme is well-known. It is for this reason that a sound management information and evaluation system has been recommended for prompt collection of vital events, maintenance of accurate and up-to-date records, compilation and prompt reporting.

However, it cannot but be admitted that the health service system (organisation or department) in our country has not yet been able to establish a proper and foolproof mechanism for this purpose. In 1963, a meeting of the Central Council of Health recommended that the Health Department must be made solely responsible for the registration of vital events and maintenance of vital statistical data through the health workers. Dr. Sushila Nayar, the then Union Health Minister accepted the proposal as valid and important but it was not taken up for implementation because the Health Department felt that it did not have adequate manpower then at the periphery for this purpose.

The Health Departments, both at Centre and State levels, have been depending all along on census data and the Sample Registration Scheme data of the Registrar General of India. From the data of the Registrar General of India we have been able to find some trends for the birth rate, crude mortality rate and infant mortality rate. But we do not have any accurate data on the maternal mortality rates which are essential to assess the impact of maternal care services (antenatal, natal and postnatal care). It has to be pointed out here that 'Health Information' published by the Director General of Health Services, Government of India every year and also the Family Welfare Year Book published by the Ministry of Health and Family Welfare, Government of India do not give any information on maternal mortality, obviously because the data are not available.

The health workers at the peripheral level have not been collecting and reporting vital events correctly due to reasons of inaccessibility, improper and inadequate home visits, lack of supervision and so on.

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It has been found by a number of evaluative studies that antenatal registration was itself very poor and the follow-up given by the health workers was inadequate. Moreover, most of the deliveries are conducted by untrained dais and others in the community. Hence, the Health Department infrastructure was not able to possess accurate information on maternal deaths and their exact causes.

The only two data sources for maternal mortality that are available at present are hospital statistics and the Sample Registration Scheme. Hospital statistics cannot be extrapolated because the cases are from different locations and, therefore, not truly representative of one particular community or area, and are usually admitted when the complication has reached an advanced stage. Hospital statistics are, therefore, highly selective. Again, the recall method adopted by the Sample Registration Scheme to obtain information on maternal mortality makes it very difficult to obtain reliable information regarding the cause of death - whether it is due to a maternal or non-maternal cause.

In most of the developing countries the information on maternal mortality rate is fragmentary, and the information on causes of maternal mortality is only that given in text books of obstetrics based on hospital records. It is because exact data on maternal mortality in India are not available that it is being given as a 'range' by WHO in their World Annual Statistics and World Health Situation Report. For example the maternal mortality of selected countries for comparison as given in the Sixth Report on the World Health Situation[1] in 1980 is as under:

Country	Year	Maternal mortality rate
Canada	1976	0.10
U.K	1976	0.13
German D.R.	1976	0.20
Singapore	1977	0.34
Sri Lanka	1974	1.0
India (present)		5-8

It may be observed that the maternal mortality rate (MMR) for India is expressed as a range and not as an exact figure as for the other countries, and that the year of reference is also not mentioned. It can therefore be concluded that not much effort has gone into ascertaining the exact maternal mortality rate (in the community) in the country.

A collaborative study on High Risk Pregnancies and Maternal Mortality (institution based) was undertaken by the Indian Council of Medical Research (ICMR) in ten teaching hospitals and reported in 1990.[2] This was a Task Force Study and a joint ICMR/UNICEF venture. While the study helped in estimating maternal mortality and the causes of maternal mortality, it had certain limitations which have been discussed in the report as follows:

"This is one of the largest studies on hospital admissions conducted in India. Estimates and inferences drawn from hospital statistics have limited value and are difficult to generalise.

"There has been a lot of debate on the usefulness of hospital MMR as an indicator of maternal health in developing countries. It has been argued that one of the reasons for underreporting in developing countries is that many deaths occur outside the hospital, cases arrive dead and are taken away before registration, or that deaths take place at home or on the way to the hospital. On the other hand, it has been pointed out that hospital based statistics of maternal mortality may in fact be overestimates of the national maternal mortality, on account of the fact that maternal deaths are less likely to go unreported as compared to births. In addition, large institutions are likely to have more complicated cases and this is particularly the case when access to such institutions is relatively easy. Here, the institutional MMR may be higher than at home.

It may be appreciated, therefore, that it is highly necessary at this stage to find ways and means of determining the maternal mortality figures in the country as accurately as possible and also to have a clear idea about the causes of maternal mortality. Needless to say, this will be possible only if there is near 100 per cent antenatal registration and close and continuous follow up.

It may not be possible for the Health Department to undertake this responsibility because at present there are two peripheral health workers for every 5,000 population. If it can be ensured that these two workers complete coverage for registration of antenatal women and are supervised properly to ensure regular follow-up, data collection on maternal mortality can be done systematically and accurate and up-to-date data can be obtained. It is for the purpose of demonstrating the methodology/approach and its feasibility for assessing maternal mortality that a study was undertaken by the Centre for Research in Health, Dindigul, Tamil Nadu, in the year 1993. The study was conducted over a one-year period from December 1992 to November 1993 utilising a Research Officer and nine Field Investigators.

Objectives

The objectives of the study were (a) to evolve a system of estimation of maternal mortality in a state; (b) to assess the maternal mortality rate in a state, and (c) to identify the causes of maternal mortality.

Study design and Sample

It was proposed to undertake a longitudinal study of pregnancies by taking a suitable sample to represent the state and to assess it by means of a close follow-up of cases of maternal deaths. The system evolved, if found feasible, could be recommended for replication elsewhere.

The study was conducted in Tamil Nadu. Four districts were selected on the basis of birth rate and one Block was selected from each district by random sampling. The names of the selected districts and blocks are given below.

District	Birth rate (1991)	Block
Anna (Dindigul)	21.3	Oddanchatram
Madurai	20.6	Melur
Coimbatore	16.3	Madathukulam
Periyar	15.6	Dharapuram

Methodology

All the pregnant mothers in all the four selected Blocks were first identified and enlisted within two months. The cut-off point for enlistment was so determined that by the close of the study all the pregnant mothers who had been registered would have completed not only the term of pregnancy but six weeks after delivery. Their duration of pregnancy and health status were collected.

After completing the enlistment of pregnant mothers, each mother was followed up by the Investigators through home visits twice a month, till 42 days after termination of the pregnancy. During every visit, information on the woman's health condition was collected and maintained in separate files to study earlier symptoms and causes of maternal mortality. In the event of a death, immediate spot verification was carried out to confirm the cause of death.

A system of informants was introduced to obtain prompt information about the deaths of the pregnant women. This was done by identifying a few volunteers in each village, explaining to them the purpose for following up the pregnant women, and requesting them to transmit information immediately to the investigators about the death of any pregnant mother.

A schedule listing all the possible symptoms was used during spot verification in order to arrive at the exact cause of death. If the maternal death occurred in a hospital, the hospital records were referred in order to collect information. (Advantage was taken of the field investigators' fortnightly follow-up visits to each village to identify and follow up newborns in the village. The purpose was mainly to test the feasibility of such a follow-up of infants which would be helpful in assessing infant mortality. This was intended only as a spin-off effect of the study).

Results

The table below gives a break up of the population covered by the study.

Oddanchatram Block (Dindigul Anna District)	94,133
Melur Block (Madurai District)	1,23,243
Madathukulam Block (Coimbatore District)	93,129
Dharampuram Block (Periyar District)	86,438
The total population covered was	3,96,943.

Maternal Mortality Rate

A total of 5,524 pregnant women were identified. Out of them, 178 were lost to follow-up within the first three months because their families migrated elsewhere in search of work.

Among the remaining 5,346 pregnant women only 4,565 could be fully followed up till 42 days after delivery because 774 cases went to their mothers' or to relatives in other villages or to a nearby town for delivery, and among the remaining seven cases, three had not delivered and four had not completed 42 days after delivery. The break-up is given below.

No. of pregnant women identified	5524
No. of pregnant women who migrated with family	178
No. of pregnant women who left for delivery elsewhere	774
No. of pregnant women who delivered but had not completed 42 days after delivery	4
No. of pregnant women who had not delivered during the study period	3
No. of pregnant women fully followed-up	4565
No. of abortions	147
No. of women who delivered	4418
No. of live births	4321
No. of still births	97
Maternal deaths:	
No. of maternal deaths due to maternal causes	8
No. of maternal deaths due to non-maternal cause	8

Maternal mortality rate = $\frac{8}{4321}$ x 1000 = 1.85 per 1000 live births

Definition adopted:

Number of deaths directly due to pregnancy or child birth and occuring during pregnancy or within 42 days of the delivery x1000 · Total live births in the year

Thus, having undertaken this study in an area and population sample representative of the state, the current (1993) maternal mortality rate for Tamil Nadu worked out to 1.85 per 1000 live births.

Incidentally, it was also possible to calculate the abortion ratio (i.e. the number of abortions per 1000 live births) from the above data as:

$\frac{147}{4321}$ x 1000 = 34.002 per 1000 live births

It may however be noted that 'abortion rate' which gives the number of abortions per 1000 women aged 15-44 years is also used. This could not be calculated as the present methodology only followed up pregnant women in the population.

Cause of maternal deaths

As mentioned earlier, there were 16 deaths among the pregnant women. Of these, eight were due to maternal causes - two each due to postpartum haemorrhage, toxaemia and severe anemia, and one as a result of obstructed labour (Table 1). There was one case of induced abortion performed by an untrained person. In fact, about three-fourths of the deliveries were conducted by an untrained person, and half of them occurred at home.

The non-maternal causes of death in the other eight cases were road accidents (1 case), heart condition (2 cases; death in a hospital), and suicide (five cases).

TABLE 1
Obstetric details and cause of maternal deaths

Cause	Place of delivery	Delivery conducted by	Place of death	Remarks
Induced abortion	Home	Untrained person	Home	Died of bleeding after induced abortion
Obstructed labour	Home	Untrained person	In tran-	On the way to hospital
Postpartum Haemorrhage	Home	Untrained person	Home	Within 1 day
Postpartum Haemorrhage	Home	Untrained person	Home	Within 2 days
Fits (Toxaemia)	Home	Untrained person	Home	Within 2 days
Fits (Toxaemia)	Hospital	Untrained person	Hospital	Within 1 day
Severe Aneamia	Hospital	Trained attendant	Hospital	Within 7 days
Severe Aneamia	Hospital	Trained attendant	Hospital	Within 7 days

Availability, accessibility and utilisation of rural health services

Follow-up of infants

As already mentioned, the fortnightly visits of the field investigators to the villages was also utilised for indentifying newborn babies in the area and following them up. Since the main study dealt with the assessment of maternal mortality and the follow-up period was therefore limited to six weeks after delivery, it did not provide for the follow up of infants for one full year of life. The situation did not lend itself, therefore, to a calculation of infant mortality. However, it has been possible to demonstrate the feasibility of using this approach to identify newborn babies and following them up every fortnight. The information on the number of newborn babies identified and followed up during the period December 1992 to November 1993 is given below.

No. of newborn babies identified in the area of study and followed up	5009
No. of infants died within 28 days	165
No. of infants died after a month	68

* These were babies newly born in the area at the time of commencing the study.

Discussion

The aim of this study was to test the feasibility of a methodology for assessing maternal mortality in a state. A representative sample of four districts from among 22 districts of Tamil Nadu comprised the study area in which four blocks were selected by random sampling. It has been possible to demonstrate that by complete identification (registration) of pregnant women and their regular follow-up every fortnight it is possible to arrive at maternal mortality figures as accurately as possible.

While the intention of undertaking this study was to assess the level of maternal mortality in a state, it is evident that it is well within the scope and competence of the health department to assess the maternal mortality in a given population and area, block, district or state. This is possible if it can be ensured by means of administrative instructions to the peripheral health workers (both male and female for every 5000 population) that they cover all pregnant women for antenatal registration and make a regular fortnightly follow-up of these women till six weeks after delivery irrespective of where the delivery takes place and by whom it is conducted or assisted. (By the same token, it is also possible for the peripheral health workers to assess infant mortality if they ensure complete registration of births and follow them up for one full year).

By using a simple structured schedule of symptoms preceding a maternal (or infant) death, the causes of maternal mortality (or of infant mortality) can be ascertained and verified by the supervisors in the Primary Health Centre or the Medical Officer.

This system can work efficiently and effectively only if there is appropriate and adequate monitoring and supervision, for which the middle level supervisors of the Primary Health Centre should be instructed, oriented and trained.

From the experience gained in this study by cross-checking the antenatal registrations done by the Female Health Worker it is clear that these workers are not registering all the women who are pregnant. This fact is well-known already and has only been reconfirmed by this study in which the Field Investigators (all male) were entirely concentrating on the identification and follow-up of pregnant women. The lesson that one could draw from this is that the Male Health Workers of the Primary Health Centre can very well be assigned this task. This will serve a dual purpose. On the one hand, the male worker can collect and possess up-to-date and accurate information on pregnancy, abortion, still births, and maternal deaths and also births and infant deaths; and on the other hand, he can pass on the information of new registrations (pregnant mothers and newborns) to the Female Health Worker for her to give maternal health and infant care services.

Regarding maternal deaths and infant deaths, the Investigators in this study had identified some volunteers and informants in the villages who transmitted the information of death immediately to the Investigators so that they could visit the family without delay and collect information about the symptoms preceding the death, and record it in the schedule that was provided to them.

Having said this, it may be appropriate to discuss the different approaches to collect the vital rates/indicators through an inbuilt system within the Health Service System, in the context of the experience gained from the present study.

If the state Health Department feels confident enough to allocate the responsibility of identifying and regularly following up pregnant women and newborn babies to the Male Health Worker and of ensuring appropriate and adequate supervision, the approach tested by the present study can be introduced in every Primary Health Centre throughout the country. By doing so, block wise, PHC wise, district wise, and state wise data on maternal mortality and infant mortality can be obtained by the Health Department itself. If the peripheral health worker is also made to collect information on all deaths, the picture will be complete.

It may be appreciated that the collection of information on births and deaths is already one of the job responsibilities of both Male and Female Health Workers. The only drawback is that it is not being done promptly and completely merely because supervision is lacking. In the present context, there is a Male Health Worker for every 5000 population. If the responsibility for registration, follow-up and thereby collection and maintenance of the important vital indicators of pregnancy, abortion, maternal death, birth, infant death (and general/adult deaths) is entrusted to the Male Health Worker and proper supervision is maintained, it will be possible for the Health Department of every state to generate and report these important statistics/indicators on a continuing basis. The Health Department will thus be self-reliant for this set of information which is very much required for its own use and there would be no need to depend on the census data (which is only available on a decennial basis) and the Sample Registration Scheme which does not provide district wise or block wise information.

The Health Workers can identify some volunteers in the villages and utilise them as informants to transmit to the worker the information of the death of any pregnant mother immediately so that necessary investigation can be done without delay. The trained dais and school teacher may also be used for this purpose for getting timely information.

It may be interesting to note in this context that in the early years of the National Malaria Eradication Programme there was a happy situation in which the malaria surveillance worker who was looking after a 10,000 population was carrying out a census every year under the supervision of the Malaria Inspector and Malaria Unit Officer and it was possible for the Health Department to get accurate annual data on population, births, deaths and migration.

The other approach would be for the Health Department to carry out sample studies just like this pilot study by selecting suitable samples of districts and blocks to represent the study. This, however, would mean the engagement of additional staff exclusively for this purpose and would, therefore, involve some extra cost for the state.

It may be appreciated that the first approach discussed above will be comprehensive and spread over the entire state (without going in for any sampling) and will be on a continuing basis; above all, there will be no extra expenditure. It will be a fully inbuilt mechanism within the existing health infrastructure and will fulfil the requirements of an efficient Management Information and Evaluation System of the Health Department.

Conclusion

As per its objectives this study has successfully demonstrated the feasibility and soundness of the mechanism for collection of data for the assessment of maternal mortality and its causes. By carrying it out in a representative sample of the population the maternal mortality rate for a state and the causes have been determined. The methodolgy adopted is in essence complete registration (identification) of pregnant women and their fortnightly follow up till six weeks after delivery. The study has also shown that the same mechanism is feasible for registration (identification) of newborns and their follow-up.

The useful lead that this study gives is that it is easily possible for state Health Departments to utilise their existing Male and Female Health Workers at the periphery, particularly the male workers, for collecting accurate information on maternal and infant mortality (and causes) and deaths (above one year) in their areas of work. Needless to say, close supervision is important. In order that this task is implemented properly the Health Department of every state will have to appreciate the following:

1. The need for and importance of collecting and maintaining vital statistics by

the department itself for purposes of planning, monitoring and evaluation as a very important component of the Management Information and Evaluation System within the health system.

2. There should be no dependence on the information available from the Registrar General through census data or the Sample Registration Scheme (SRS). (As observed earlier, census data are available only every ten years, and the SRS does not provide district wise or block wise information. The Health Department should, therefore, be self-reliant in terms of collecting and maintaining important vital statistics indicators on a continuing basis year to year.
3. The existing health infrastructure has enough manpower to undertake the responsibility for collection, maintenance and reporting of statistical information on vital events. The peripheral health staff have to be given the responsibility and be properly oriented and supervised.

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News and Notes*

Education for All from the world's most populous countries

The world's two most populous countries - China and India - have joined seven other countries in a pledge to reduce illiteracy, lower fertility rates and achieve higher economic growth. The seven other governments are Indonesia, Nigeria, Brazil, Pakistan, Bangladesh, Mexico and Egypt. Together, the nine countries account for half of the world's population and seven of every ten illiterate adults.

The declaration calls for the nine governments to wipe out illiteracy "by the year 2000 or at the earliest possible moment". In signing a declaration at the New Delhi Education for All conference, the governments promised to "rally all sectors of our society towards education for all" to give it the highest priority at national and other levels, and to ensure that a "growing share of the national and community resources is dedicated to basic education." The Delhi conference was organized by UNICEF, UNFPA, and UNESCO.

UN release quality of life index

According to the United Nations' Human Development Index, published in June, 60 per cent of the world's population now enjoy "fairly satisfactory" human development levels compared with only 25 per cent in 1960. The index is calculated on the size of a country's income per head, the educational attainment of its citizens and how long they live. Guinea retains its position as the least developed country in the world : life expectancy is 43.9 years, the adult literacy rate is 27 per cent and the average child spends less than one year in school. Gross domestic product is $500 per head. Canada ranks first on the scale, followed by Switzerland and Japan.

High fertility still acceptable in Africa

For the foreseeable future the extended family and high fertility will continue to offer Africans more security than any other form of reproductive behaviour, according to demographer Aaron Segal, writing in *Africa Today*. High fertility remains an important strategy for

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* *Source: IPPF Open File, July 1994*

African women because it confers not only recognition and social status but also land for food cultivation, and low rates of literacy and formal education result in few alternatives except early marriage for girls.

Detailed surveys suggest that the concept of fertility reduction and family planning still has limited legitimacy and even hostility in Africa. Segal says that it is demand, or lack of it, rather than costs, administration or availability that remains the real problem. While democratically elected political leaders in several countries have endorsed family planning, this has yet to be reflected in increased demand for services. Services are promoted through the media, outreach workers, community health teams and other systems and effective programmes are filling the gap of unmet contraceptive need, but the author concludes that the kind of combined changes necessary for altering fertility behaviour are unlikely. Changes in the status of women, age of marriage, child spacing, agricultural productivity and improved nutrition are taking place but not on a scale capable of slowing population growth.

The onset of the demographic transition is occurring in Kenya and some other countries, but slowly. The need for population policies is steadily advancing, with most African governments showing official commitment either to reducing fertility and/or providing family planning services. These could, especially if combined with maternal and child health, accelerate the transition, Segal says.

AIDS growing in China

Reseach papers prepared by the Chinese government, and released at a conference in May, estimated that China already has 4,810 to 11,415 people who are HIV-positive and projects that the number could exceed 253,000 by 2000 if preventive measures are not taken. This figure compares with 1,361 people who have been found to be seropositive through official testing, a figure that includes several hundred foreigners, who were expelled after testing positive. Three-quarters of those infected with HIV are intravenous drug users along the southwestern border with Burma. Officials at the conference stressed that China cannot afford to be complacent because infections resulting from heterosexual contact are increasing faster than the number of drug-related infections. (*International Herald Tribune*, France, 1 June 1994)

Ten per cent of European pregnancies unplanned

A multi-national survey of 10,000 European women aged between 16 and 30 has revealed that 10 per cent of the women had experienced at least one unplanned pregnancy. The Survey also found that 18 per cent of the unplanned pregnancies occurred while women were using an oral contraceptive (OC). Results of the Wyeth Ayerst Contraceptive Survey indicate that many women are not using OCs correctly with one in five women forgetting to take the Pill at least once in every cycle. As many as 84 per cent of women did not know that other medications such as antibiotics can lessen the effectiveness of OCs.

The most frequent reasons for discontinuation of pill use were nuisance side-effects such as weight gain, headaches and breast tenderness. Professor Michael Rosenberg from the

University of North Carolina said the survey shows the need for improvement in compliance and continuity of Pill use. "This should be a shared responsibility of patients, doctors and pharmaceutical companies," he said,. "(Doctors) should counsel their patients to use the OC correctly, and pharmaceutical companies should ensure that information given on the Pill is easy for the patient to interpret. Patients should know when they miss the Pill and always have back-up methods ready."

Contraceptive usage up in Russia

The attitude of the Russian population towards modern methods of contraception is changing positively, despite great social and financial difficulties, according to researchers in Moscow. They have found that 35 per cent of the female population now wish to use the IUDs and 18 per cent wish to use hormonal contraception. But although family planning services are becoming more readily obtainable, availability is still limited. The number of abortions carried out in Russia each year has dropped recently from four million to 3.5 million.

Asian population pressure dramatically decreased

Family planning has dramatically decreased population pressures in Asia, according to a new statistical analysis from the Population Reference Bureau. Fertility has declined by more than 40 per cent since 1960, contributing to significantly improved maternal and child health. Most Asian nations have also witnessed declines in their mortality rates even greater than the changes in fertility, the report says.

Fertility levels in the South and South-east Asia regions were about the same in 1960, but today fertility in South-east Asia is nearly 30 per cent lower, thanks to the greater use of family planning there. Eudcation and place of residence have important demographic impacts. Educated women are more likely to plan their pregnancies, while in countries where few couples practise family planning, such as Pakistan, urban and rural fertility trends are substantially different.

Even in the absence of significant economic and social advancement family planning programmes can achieve remarkable results. In Bangladesh, contraceptive prevalence has increased from three per cent in the early 1970s to 40 per cent today. Political commitment and a well designed, culturally appropriate family planning programme have been key to this development.

Despite great successes in the region, Asia still faces population challenges. The regional fertility rate is 3.2 children per woman, but when China is excluded it is about four children per woman. The report concludes that "Even if countries were to maintain current levels of contraceptive use, the number of married women that family planning programmes will have to serve increases dramatically - from 134 million in 1990 to 245 million by the year 2025".

Reproductive health campaign launched in Bolivia

To combat the highest maternal mortality rate in the Western Hemisphere, the Bolivian Ministry of Health, with assistance from the John Hopkins School of Public Health's Population Communication Services project, has launched one of the most comprehensive reproductive health campaigns ever in Latin America. Using television, radio, and print messages, the campaign alerts the public to reproductive health care and urges people to visit clinics for advice from trained counsellor. The risk of a Bolivian woman dying during pregnancy is 60 times that of a woman in Europe or in the US, according to the programme's coordinators, and Bolivia has the second highest infant mortality rate in the Western Hemisphere, after Haiti.

The campaign addresses four crucial components of reproductive health : family planning, prenatal and postnatal care and safe delivery, breastfeeding and prevention of illegal abortions. The campaign is the work of a technical committee that brings together representatives of 17 Bolivian private and government agencies.

The real facts about adolescent pregnancy in the USA

The public's distorted view of adolescent sexual and reproductive behaviour in the USA impedes society's willingness, and its ability, to cope with the potentially serious problems of unplanned pregnancy, abortion, and the spread of STDs including HIV. According to the Alan Guttmacher Institute, myths linger mainly because the many studies that have been completed on adolescent sexually are often contradictory and confusing. Filling this information gap, the Institute has completed its own report that documents the reality of young people's lives and their attitudes to sexuality and reproduction. The report disputes the suggestion that adolescent pregnancies are "soaring", saying that pregnancy rates among sexually experienced adolescents actually fell by 19 per cent between 1972 and 1990, from 254 to 208 pregnancies per 1,000 sexually active women aged between 15 and 19 years.

It goes on to say that, contrary to popular belief, young people are quite capable of using contraceptives reliably and prevention programmes can pay an integral part in shaping attitudes and approaches to sex and contraception. Institute research suggests that two-thirds of adolescents use some method of contraception the first time they have sex and 70 per cent of sexually experienced women between 15 and 17 use contraception reularly for STD prevention as well as to prevent pregnancy.

Some intervention programmes have been successful in helping young people to delay first intercourse and in improving contraceptive use among the sexually active. The most effective programmes combine innovative, comprehensive sexuality education, skills for making decisions about having sex and for communicating with partners, and access to family planning services. Evaluations of primary prevention efforts show that programmes designed to increase knowledge and to improve access to contraception do not encourage participants to engage in sex earlier or more frequently than those not involved in such programmes.

New concept in IUDs could revolutionize method

Impressive results of an international, multicentre study of a new IUD were reported during the Third Congress of the European Society for Contraception. This new device, called GyneFix, was developed because a relatively high percentage of women who use IUDs experience heavier and more painful periods than before, and this makes them abandon the method. GyneFix's different shape and its flexibility cause less bleeding and virtually no pain problems. Unlike existing IUDs which have a rigid frame-like shape which takes up a large amount of space in the uterus, the new IUD consists of a number of copper beads threaded on to a length of nylon. It is inserted like other IUDs, but is attached to the roof of the cavity of the uterus thus avoiding displacement or expulsion of the device.

Introducing the device at the Congress, Professor Van Kets, from the University of Ghent, said the design and characteristics of the new IUD result in an impproved tolerance and virtual absence of expulsion, a major improvement on the conventional IUDs. The new device also appears to be more effective, with efficacy rates as high as oral contraceptives.

GyneFix is being presented as the best choice of IUD for young and nullogravid/nulliparous women. Existing IUDs are generally reserved for parous women, are not considered appropriate for women at risk of sexually transmitted disease and pelvic inflammatory disease (PID). However, Van Kets says the results with the GyneFix support the view that it is not the age or nulliparity of the woman but her life-style which may enhance the risk of PID. The method is expected to be marketed in Europe in 1995.

Success rates in vasectomy reversals

Men who want a reversal of a vasectomy may reasonably be told that the overall chance of success as measured by a pregnancy in their partner is 50 per cent. Many more achieve patency but fertility depends on the time since the vasectomy operation was performed. If the interval is three years or less the chances are 75 per cent, declining to 50 per cent by eight years and to 30 per cent after 15 years.

Hormone produced during breastfeeding

A new discovery by the Weizmann Institute of Science in Israel highlights growing acceptance within the scientific community that the breast is more than a passive udder designed to dispense calories to a baby. From experiments with rodents, the Institute discovered that the breast not only extracts potent hormones from the mother's blood and concentrates them in the milk, it also generates some of these hromones itself to assure that a rich yet precisely calibrated supply of the compounds will end up in the infant's food.

The scientists found that a gene in charge of producing an important brain hormone, gonadotropin-releasing hormone, is switched on in the mammary glands of nursing rats, but not in the breast tissue of virgin rats. The researchers are almost sure the results apply to humans, too. They are unclear about what exactly the hormone does for a suckling infant but they suggest that it influences the development of the newborn's sex organs, forestalling their maturation until the offspring is ready for reproduction. It could aslo assist in the wiring of the brain regions in command of sexual behaviour.

Scientists develop anti-HIV gel from seaweed

A seaweed extract known as carrageen, commonly used in ice-cream and sweets, is to be tested as a vaginal gel that may block HIV, allowing women to protect themselves from infected partners. Dr. Christopher J. Elias of the Population Council has announced that his organization will soon be applying to the Food and Drug Administration for permission to test the substance. Carrageen has been shown in laboratory tests to prevent HIV from infecting the type of cells that line the vagina.

Progress on preventing HIV transmission from mothers to babies

Zidovudine and delivery by caesarean section have a major role in stopping the transmission of HIV from pregnant seropositive mothers to their babies, according to recent reports. European studies have found that about one in seven HIV - infected mothers passes infection to her baby, in pregnancy or at birth. This doubles when the mothers also breastfeed.

The transmission of HIV from mother to child may be reduced by half if the baby is delivered by caesarean section, according to a new study by the Institute of Child Health in London, which is taking part in the European Collaborative Study of infected mothers. The researchers suspect that the rate of HIV is higher among children born vaginally because of exposure to contaminated blood or secretions in the birth canal. They say there is accumulating evidence that caesarean section is protective and a decision to continue with vaginal delivery could result in avoidable infections. However, they add that the evidence is not conclusive and "it would be undesirable if an ineffective procedure was to become routine practice".

Several interventions are now known to be at least partly effective, according to Mary Glenn Fowler of the US National Institutes of Health, who was speaking recently at a London meeting of virologists and obstetricians. Zidovudine reduces transmission by two-thirds, but doctors are uncomfortable about giving such a powerful drug to fetuses that may not need it. Many of the interventions carry risks for the 85 per cent of babies of seropositive mothers who are born healthy anyway. The conference debated ways of improving the uptake of screening and the treatment of high-risk pregnancies, and urged better counselling of mothers.

Meanwhile, the number of babies and children with HIV infection seen in London's St Mary's Hospital has risen 600 per cent in the past three years, from 15 children when the paediatric HIV centre began in 1991 to 100 today. Most of these children are the children of HIV positive mothers.

A five-year evaluation of Norplant in China

A prospective multicentre clinical trail of 10,718 women was carried out to assess the efficacy, safety and acceptability of Norplant implants when used by Chinese women. The women were monitored at six-monthly intervals for the first two years and then annually throughout the five-year study

The results showed that the five-year average annual pregnancy rate was 0.3 per 100 woman-years, and the ectopic pregnancy rate was minimal, 0.09 per 1000 woman-years. Pregnancy rates correlated significantly with weight, but were always below one per 100 women-years. Younger women experienced higher pregnancy rates than did older users.

Headache, myoma, dizziness, and weight gain led more frequently to termination than did other adverse events apart from menstrual disturbances. Mortality during use was 2.0 per 10,000 years based on 44,954 years of experience. There were no cardiovascular or cerebrovascular deaths, and no deaths were attributable to Norplant use. Seventy-two per 100 initial acceptors used the implants continuously for five years. The researchers conclude that Norplant implants prove highly effective, safe, and acceptable among Chinese women.

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To desseminate knowledge and education about, and to promote the adoption of, the practice of family planning for the advancement of basic human rights, family and community welfare, the achievement of a balance between population, resources and the environment, and the attainment of a higher standard and quality of life.

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To foster and develop contacts with other organisations engaged in similar types of work in India and abroad.

Clauses 8 to 18 deal with administrative and financial subjects.

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